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MERRITT LYNDON FERNALD, Editor-in-Chief

CHARLES ALFRED WEATHERBY
LUDLOW GRISCOM
STUART KIMBALL HARRIS

} Associate Editors

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NOTES FROM THE BEBB HERBARIUM OF THE UNIVERSITY OF OKLAHOMA—II¹

MILTON HOPKINS

THE ROBERT BEBB HERBARIUM.—Robert Bebb, senior member of the Bebb Floral Company of Muskogee, Oklahoma, died on February 21, 1942, after a prolonged illness. By the terms of his will the University of Oklahoma received his herbarium, comprising about 30,000 specimens, largely from Oklahoma but also from Illinois, Indiana, Texas, Minnesota, California and the Rocky Mountain region.

At its meeting on the 5th of May, 1942, the Board of Regents of the University unanimously voted to name the herbarium in honor of this distinguished amateur botanist and it has therefore become officially, the Bebb Herbarium of the University of Oklahoma. In the succeeding pages, references to this name indicate not merely the personal herbarium of Mr. Bebb, but rather the entire collections of the University, which now bear that name.

Robert Bebb was the youngest child of Michael S. and Katherine Hancock Bebb. He alone, of their children, was interested in pursuing the avocation which his father had so successfully followed. As a child he often accompanied his father on those numerous field trips which meant so much to them both. In his early manhood he was able to make trips on his own because

¹ I am deeply indebted to the Committee on Research Grants of the Society of the Sigma Xi for awarding me a grant-in-aid from its Alumni Fund. This made possible my work for this paper (and others), which was done at the Gray Herbarium of Harvard University. I wish also to thank Professor M. L. Fernald, Director of the Gray Herbarium, and the other members of the staff, who placed the entire facilities of the institution at my disposal, and gave me every possible courtesy and consideration.

his work as a Grain Receiving Agent for the Rock Island Railroad made it possible for him to have the afternoons free for collecting. At this time he also became intensely interested in landscape architecture and horticulture.

When he moved to Muskogee in 1910 and purchased the floral business which bears his name, he was so busy with the work of building the firm to the high standards of quality which it now enjoys, that he found only brief time for the pursuit of his hobby. During the vacations, which he never permitted to extend more than the usual two weeks, he botanized wherever the family went for the summer, sometimes in Colorado, sometimes in California and often in Minnesota. If there were free evenings he identified his specimens as best he could. If not, they were taken back to Muskogee and such time as was available was devoted to them. Because of pressure of the business, many of these early collections remained unidentified for years.

When he retired from business in 1936 he was able to devote practically all of his time to botany. This hobby occupied the daylight hours of spring, summer and fall, when he enjoyed long field trips. The winter days were spent in his library working on his identifications. He restricted his botanical activities to eastern Oklahoma, all areas of which were within easy driving distance from Muskogee. The country in which he worked has only been superficially botanized, except for the work of E. L. Little, Jr.¹, whose publications on Muskogee County were familiar to Bebb. Latterly, the Bebb family purchased a summer cottage in Hubbard County, Minnesota, and there Mr. Bebb collected almost daily during July and August.

He was always insistent on having authentic determinations made for all his specimens, and when he could not satisfactorily identify a plant or when I was not able to help him on some of the more critical genera he would ask me to whom he might send his material for further checking and study. He enjoyed his correspondence with these various authorities and also with the curators of the large herbaria. When in the fall of 1941 he realized that he would probably not live through the winter, he set to work assiduously on his plants and made it a point to

¹ The Vegetation of Muskogee County, Oklahoma, in *Am. Mid. Nat.* **19**: 559-572. 1938. Flora of Muskogee County, Oklahoma, in *Am. Mid. Nat.* **19**: 369-389. 1938.

clear up the various problems which had been bothering him. He repeatedly informed me that he did not want to leave his herbarium in such a condition that it would require precious hours of my time rechecking and further identifying his material. At the time of his death nearly all of his recent collections were ready for insertion and the duplicates were arranged in precise and orderly fashion, requiring only the labels before being sent out in exchange. These duplicates are now in my storeroom and will be duly distributed whenever clerical help is available. Several thousand of these await the attention of a typist.

Mr. Bebb had the zeal and enthusiasm of a great botanist. Had he been able to pursue his hobby continuously during his earlier life his fame would undoubtedly have eclipsed that of his father. In the field he was constantly in search of rare and unusual plants and was always conscious of the most minute variations. If a plant looked slightly unfamiliar or if it did not quite ring true in his mind, he always collected large numbers of duplicates so that other botanists might share his discovery.

With characteristic modesty he underestimated his ability, and in the last few months of his life he repeatedly said that he hoped his efforts had been of some consequence but he felt that they were merely routine. I am quite certain that he was completely unaware of the new records for the Oklahoma flora which he had obtained, except as his various professional acquaintances informed him of them during his lifetime. Many of them were found only gradually as his personal herbarium was being inserted into that of the University. Some of these are included in the present paper, but as the work of insertion is still far from complete, many records are necessarily omitted.

With his herbarium, his widow, sons and daughter (Florence P. Bebb, Maurice R., Forrest and Mabel B. Potter) graciously insisted that the handmade solid walnut cases belonging to M. S. Bebb be included. These were made from an old tree which stood for many years on the farm at Rockford, Illinois.

EPIPACTIS GIGANTEA Dougl. MURRAY COUNTY: seepy, springy slopes of limestone in Dripping Springs, Cowpen Canyon in the Frank's Conglomerate formation, Arbuckle Mts., *Hopkins*, no. 5995.

This exquisite orchid, standing about two feet high, grows

abundantly in banks of Venus-hair fern which forms great mats around it. Water from clear limestone springs above the banks trickles down gently over its roots. This seems to be the only locality where the plant has been found in Oklahoma. The station nearest the Arbuckles one is in the vicinity of Dallas, Texas (100 miles to the south), but the orchid occurs in several southwestern counties of that state. Westward, south and north it has been collected in Mexico, and through New Mexico and Arizona to California, then locally throughout the Rockies to British Columbia. Of distinct Cordilleran affinities, its occurrence in Dallas and in the Arbuckles is of special interest.

LOEFLINGIA TEXANA Hooker. HARPER COUNTY: sand dunes on north side of Cimarron River, *Frank McMurry (ex. herb. Wichita Mt. Wildlife Survey, Cache, Oklahoma)*.

This caryophyllaceous plant is listed from both the Edwards Plateau and the Plains Country regions in Texas by Cory.¹ Its inclusion in the Oklahoma flora is not surprising, as Harper County is usually included in the Plains region. That it has never before been collected within the state is probably due to the fact that the northwest counties have never been botanized extensively, and the collections of the late G. W. Stevens of Alva, while numerous, were for the most part extremely local and rather spasmodic. The large number of specimens which he took to the Gray Herbarium for his doctoral thesis (approximately 6,000) were obtained chiefly on field trips during the summers of 1912, 1913 and 1914. His itinerary was supposed to cover nearly all of Oklahoma. Obviously, his material from any one region could hardly be expected to be a complete representation of the plants occurring there.

This specimen closely resembles an *Arenaria*, and might easily be confused with that genus. Robinson gives its distribution from "Central and Eastern Texas . . . northward to Nebraska"², but there are no specimens in the Gray Herbarium from Oklahoma or the Indian Territory.

ARABIDOPSIS THALIANA (L.) Heynh. McCURTAIN COUNTY: deep, rich, wet woods of sweet gum and red maple near Mt. Fork River, 5 miles north of Broken Bow, *Hopkins*, no. 6260.

No mention of the occurrence of this cruciferous plant in

¹ Catalogue of the Flora of Texas, Tex. Agri. Exp. Sta. Bull. no. 550: 44. 1937.

² In Gray, Synop. Flora i, pt. i, fasc. ii: 255. 1897.

Oklahoma has been made in the literature, and search through the large herbaria has failed to discover any specimens. It represents a new record for our flora and extends the range southwest. Broken Bow is immediately south of the Ouachita Mountains, in extreme southeastern Oklahoma.

ARABIS VIRIDIS AN INVALID NAME.—When I published my treatment of this genus in eastern and central North America¹, I completely overlooked *A. missouriensis* Greene.² Mr. C. V. Morton very kindly called this to my attention several years ago but I waited to correct the mistake until I had ample time to study the two species. Through the kindness of Dr. Theodore Just of Notre Dame University, I was able to obtain a photograph of the Greene TYPE (*B. F. Bush*, no. 31, Montier, Missouri) on which he based his description of the species. I also sent adequate specimens of *A. viridis* to Dr. Just who very graciously agreed to compare them with the type. This comparison was done by Mr. Merton J. Reed, one of Dr. Just's graduate students, and the results of his work clearly indicate that *A. viridis* and *A. missouriensis* are one and the same species. The latter name must, therefore, be taken up and the former reduced to synonymy.

Dr. Reed C. Rollins, visiting the Greene Herbarium in 1937, also recognized the identity of *A. viridis* and *A. missouriensis*. Likewise, he has annotated the specimens in the Gray Herbarium but has tactfully not publicly corrected my error, preferring to give me an opportunity to do so myself.

I am exceedingly grateful to Mr. Morton for his kindness in bringing to my attention this error and to Dr. Just for helping me to rectify it.

A. viridis var. *Deamii* thus becomes *A. missouriensis* var. **Deamii** (Hopkins), comb. nov.

LATHYRUS VENOSUS Muhl. var. *MERIDIONALIS* Butters & St. John. McCURTAIN COUNTY: clay soil, 8 miles northeast of Broken Bow, *D. B. Lemon* (*ex. herb. Okla. A. & M. Coll.*).

Butters and St. John³ list this variety as a southern one, citing specimens from North Carolina, Georgia, Louisiana and Texas, and from seeds collected in Tennessee and grown in the Harvard

¹ *RHODORA* 39: 155-160. 1937.

² Fedde, Rep. Nov. Sp. 5: 244. 1908.

³ *RHODORA* 19: 158. 1917.

University Botanical Garden. The Gray Herbarium has a specimen from Arkansas, but no citation from Oklahoma occurs in the manuals or floras nor do any of the checklists or works on the flora of Oklahoma mention it. The specimen in the Bebb Herbarium is one obtained in exchange with the Oklahoma A. & M. College, and was identified as *L. venosus*. Perusal of Butters and St. John's paper on the genus and comparative study with specimens in the Gray Herbarium indicate that the typical form of the species does not extend so far south. Our Oklahoma material should all be referred to the variety and inclusion of it in the native flora extends the range into a new state.

ERODIUM CICUTARIUM L'Hér. PITTSBURG COUNTY: waste places near McAlester, *Auval H. Brown*, no. 8.

An introduced weed, this plant has never been recorded from the state previously. Undoubtedly further collections will reveal it to be of rather common occurrence.

CNIDOSCOLUS TEXANUS AND *C. STIMULOSUS*; THEIR STATUS IN THE OKLAHOMA FLORA.—For several years I have been troubled by the identification of these two species and several of my colleagues asked me if it would be possible to study them and ascertain just what the ranges of each were, and whether one or both (or neither, there being an undescribed species of Mexican affinity in southwestern Oklahoma) occurred here. Accordingly, I took all the material in the Bebb Herbarium to Cambridge for study. The results of my investigation indicate that, of these two species, only *C. texanus* occurs in Oklahoma and Texas. *C. stimulosus* is strictly a coastal plain species,¹ occurring from Virginia south to Florida and on the gulf coastal plain to Mississippi and Louisiana. It is not represented in the Gray Herbarium from any Texas locality. *C. texanus* is the plant of the interior (Texas, Arkansas and Oklahoma), having larger flowers, a more heavily armed staminate calyx and more numerous spines on the stems and leaves. *C. stimulosus* has the flowers smaller, a nearly glabrous staminate calyx and fewer spines on the leaves and stems.

Small² correctly differentiated the two species but extended

¹ Fernald in RHODORA 44: 236-246. 1942.

² Flora, ed. 1: 706. 1903.

the range of *C. stimulosus* as far west as Texas. The range of *C. texanus* is properly given as "Arkansas and the Indian Territory to Texas". Cory¹ lists both species in Texas, giving the locality for *C. stimulosus* as the Rio Grande Plains (his Area no. 3, comprising all the counties in extreme southern Texas in the Rio Grande Valley).²

Stemen & Myers³ list both species from Oklahoma. Their work is largely a compilation from Small's Flora as it pertains to this state, and where Small erred these authors likewise err.

G. W. Stevens' unpublished manuscript Flora of Oklahoma (original in the Widener Library of Harvard University; duplicate copy in the Library of the University of Oklahoma) also lists both species from our state but he, like Stemen & Myers, also followed Small to a large extent. Many of Stevens' records have been shown to be inaccurate and his determinations are likewise often insecure. Until a more thorough and complete knowledge of our native flora is obtained it would be unscientific to try to publish the Stevens manuscript.

CALLIRHOE INVOLUCRATA (T. & G.) Gray, forma **incisa**, n. f. Petalis apice incisis. CLEVELAND COUNTY: woodland copse near South Canadian River, Indian Springs, 4 miles south of Norman, Hopkins, no. 1296 (TYPE in Bebb Herb. Univ. of Okla.).

This unusual plant has the petals sharply incised to a depth of about 5 mm. instead of having them truncate at the apex as in the typical form of the species. I have seen no other plants like

¹ Catalogue Fl. Tex., 64. 1937.

² When I wrote Mr. Cory regarding the distribution of this plant several years ago and asked him for his personal field experiences with it, his reply was, in part, as follows:

"It has been my experience that practically all this material [from Texas] is of the species *texana*. [referring to the generic name *Jatropha*.] As I recall it, my only collection of the true *stimulosa* is from Maverick County, below Eagle Pass. Two or three years ago I collected a similar species, but apparently a different one, in the mountains near Sabinas Hidalgo, Nuevo Leon, Mexico. I did not get to preserve this specimen. Judging from the distribution of the two species, it would seem highly probable that the plant from along the Rio Grande would not be *stimulosa*. If it really is some distinct Mexican species, then we do not have any *stimulosa* in Texas. I should be inclined to suspect that you have only *texana* in Oklahoma. We have to rely upon the key in Small's Manual of the 1903 edition for the separation of these two species. All that I can say now is that we should have two species in Texas, one of which is most certainly *texana*, and the other probably a Mexican species." (letter dated 22 June 1940).

Although he listed *C. stimulosus* from Texas in his Catalogue in 1937, he apparently realized in 1940 that typical *C. stimulosus* is absent from the Texas flora, and therefore, should be written out of the Catalogue (page 64).

³ Oklahoma Flora, 286. 1937.

it, outside of Indian Springs, where it appears to grow abundantly. Many plants have been found there.

VIOLA STRIATA Ait. MUSKOGEE COUNTY: deep, rich woods in dry soil, *Robt. Bebb*, no. 5251.

Among the most interesting of the new records based upon discoveries by the late Mr. Bebb, this little violet gave him the greatest pleasure. Its southwestern limit is thus extended into Oklahoma. He was always extremely modest and when I informed him of this new record for the state he insisted that the greatest possible care be exercised in checking its identity. He was invariably pleased at any of his "finds" but firm in his insistence that no credit be given him.

LYTHRUM LINEARE L. PITTSBURG COUNTY: swampy valley in deep woods, *J. E. McClary*, no. 49.

In studying the various species of this genus at the Gray Herbarium I was surprised to find a plant from Oklahoma with all the leaves opposite. Further, the opposite leaves on this specimen are narrowly linear and the longest is only 2.5 cm. The plant is obviously *L. lineare* but it is considerably more inland than its range would indicate. Pittsburg County, in southeastern Oklahoma, has a few representatives of the Coastal Plain flora (*Pinus echinata* being noteworthy), but ordinarily one does not expect to find plants characteristic of that region in the county. The western limit of *P. echinata* is just outside of McAlester (about 5 miles to the east on U. S. Highway 270), and it is likely that McClary, a former student at the University of Oklahoma, botanized in the outlying areas of the town extensively. His home was there.

The plant in question matches typical and authentically determined specimens, and it fits the descriptions in the manuals and floras. This station is far inland from the normal range of the plant and constitutes a new state record. Cory¹ gives its range in Texas as "Coastal Prairies" (his Area no. 2). This region constitutes only those counties along the Gulf of Mexico from the Louisiana state line to the vicinity of Corpus Christi. To reach the Oklahoma locality the migration of the species would have to have been via the Mississippi, Red and Boggy Rivers. Numerous creeks running south from Pittsburg County drain into the latter.

¹ Catalogue, 75.

ZIZIA APTERA (Gray) Fern. ADAIR COUNTY: hills in open woods, *Robt. Bebb*, no. 5210.

This collection, by the indefatigable Mr. Bebb, represents another extension of range southwestward. It is new to Oklahoma, the nearest station being in Missouri. I did not learn of this until after Mr. Bebb's herbarium had been brought to Norman and I began inserting his plants with those in the local herbarium. He identified the specimen as *Z. cordata*, but did not indicate that it constituted a new record. He thought that the herbarium at the University was much more complete than it was (or is now!) and did not realize that any of his contributions would be of major interest.

FRAXINUS PENNSYLVANICA VAR. *AUSTINI* IN OKLAHOMA.—Professor Fernald, discussing the varieties of this species¹ gives the range of this one from "Quebec to Manitoba, south to Nova Scotia, New England, northern New Jersey to upland of Virginia, New York, Ohio, Illinois and Iowa." In endeavoring to "order up" this genus in the Bebb Herbarium I found that several of our specimens² exactly fitted his description of this variety and that they would key out to none other. Consequently, I took them all to the Gray Herbarium for comparative study. They are doubtless this variety and I am therefore making what Professor Fernald indicates for all the American ashes, a "hopelessly tentative" determination. These specimens extend the range of the plant southward to the Wichita Mountains of southwestern Oklahoma. Inasmuch as these mountains harbor such eastern plants as *Arabis missouriensis* (in the greatest abundance, so that one almost thinks of it as a weed), *Acer saccharum* (in that region treated by most Oklahoma botanists as *A. grandidentatum*, but clearly not that, although further study

¹ *RHODORA* 40: 452-453. 1938.

² *Waterfall*, no. 2935, along creek in open woods, Medicine Park, Wichita Mts., Comanche County; *Waterfall*, no. 2944, along ravine west of Medicine Park, Wichita Mts., Comanche County; *Mrs. J. Clemens*, no. 11,725a, Fort Sill, Comanche County. Mrs. Clemens was the wife of an Army Chaplain stationed there. She collected two specimens of this identical number but with different dates. The one in the Bebb Herbarium is dated June 22, 1916 (a), and the one in the Gray Herbarium bears the date 25 May 1916 (b). The latter specimen has the long samaras (over 4 cm.) of var. *typica*; the former has the shorter samaras of var. *Austini*. Collected about a month apart the two specimens were doubtless obtained at different localities on the post. Fort Sill was then, and is now, the largest Field Artillery School in the country and affords, within its own gates, many varied and unique collecting spots. Also, it is well within "gunshot" of the Wichita Mountains, being only a few miles away.

may reveal it to be merely an isolated variety of the typical New England sugar maple)¹, *Phryma Leptostachya* (the typical form) and *Arisaema Dracontium* (though perhaps not quite as "eastern" as the others, still not quite so "western" as the Wichitas), it is not unusual that one should also find this ash.

FRAXINUS TEXENSIS (A. Gray) Sargent. MURRAY COUNTY: open, xeric, calcareous outcrop in the center of Scott's Dome and adjacent to an old asphalt mine, Viola Limestone Formation, Arbuckle Mountains, *Hopkins*, no. 5305.

Locally abundant in the various limestone formations of the Arbuckles where it grows at the bottom of gullies and ravines, this plant appears to be unrecorded from the state. Closely related to *F. americana*, it is immediately differentiated by its smaller, more ovate leaflets which are usually fewer in number than in the former species, and by its shorter, smaller samaras. Asa Gray interpreted it merely as a variety of the white ash, but it is a tree of considerably lower stature and has numerous other characteristics which are adequate for maintaining it as a distinct species.

Although it is common in and nearly restricted to, the Arbuckles, there is one specimen in the Bebb Herbarium from Cherokee County, in northeastern Oklahoma (*Mr. and Mrs. E. L. Little, Sr.*, near Talequah, no. 149). Talequah is in a limestone area and it is quite likely that the specimen was found on

¹ Inasmuch as none of the authors prior to 1912 include *A. grandidentatum* in the flora of this state, it seems quite probable that the Wichita Mt. specimens were first identified (erroneously?) by G. W. Stevens (about 1915-16) as that plant, and that succeeding authors merely accepted his determination without further questioning. Sargent (Man., ed. 2: 693. 1922) cites Stevens as the authority for this record. Mattoon (Forest Trees of Okla., ed. 1: 61. 1927) refers the plant to *A. saccharum* var. *grandidentatum* with the notation: "found in the Wichita Mountains of southwestern Oklahoma, but is rare and local." Later editions of this booklet (five in all) give it specific rank and all of them attribute it to the Wichitas. Jeffs & Little (Preliminary List of the Ferns and Seed Plants of Oklahoma: 71. 1930) include it. Stemen & Myers (Okla. Flora: 304. 1937) do likewise. But VanDersal (Handbook of Native Woody Plants of the U. S., U. S. D. A. SCS-TP-11: 32. 1936) very definitely, and I believe correctly, omits it from the Wichitas. However, in the later, published edition (the first one was only mimeographed) he includes it (Native Woody Plants of the U. S., U. S. D. A. M. P. no. 303: 40. 1938). The problem needs detailed study and no conclusions must be drawn at the present time. The above notes are included here merely to introduce the question as to the presence of the plant in the Wichitas. My own (and admittedly very brief) field experience with this tree has been just enough to convince me that it is probably only an ecological (or genetic) variant of the eastern sugar maple. Its occurrence in the Wichitas could easily be explained by the same hypothesis which accounts for its presence in Caddo Canyon, some 60 miles due north. This hypothesis was proposed by me several years ago (see RHODORA 40: 431. 1938).

calcareous rocks. If this is so (there is no indication on the label, however), it adds an additional link to my argument that an ancient flora existed on the thin limestones which were formed by the recession of the Comanchian Sea, in the southern Mid-Continent area of the United States. This idea was elucidated in an earlier paper¹ and was based on evidence illustrated by the present distribution of *Juniperus mexicana*², whose range is not unlike that of the Texas ash. The only northern Oklahoma station for the juniper (outside the Arbuckles where it too abounds) is in Mayes County which is not more than 25 miles north of the station for the ash. Both areas are in the Boone Limestone formation.

DICHONDRA REPENS Forst. var. **CAROLINIENSIS** (Michx.) Choisy.
LEFLORE COUNTY: damp ground in rich woods, *Robt. Bebb*, no. 5403.

Again, Mr. Bebb told me nothing of this plant and I did not discover it until I began inserting his specimens. It is new to Oklahoma, being found elsewhere from Virginia to Florida, west to Texas, chiefly in the coastal regions. It was originally identified by the collector as *D. evolulacea*—with a question mark—but I have checked my own determination. No previous records of its occurrence in our state are extant.

HEDEOMA ACINOIDES Scheele. **MURRAY COUNTY:** hillsides, near Prices Falls, in the Viola Limestone formation, *Tenney*, no. 170.

This plant constitutes another state record for the Oklahoma flora. Previous records indicate its occurrence in the adjacent states of Missouri, Arkansas and Texas, but none of the literature from this state mentions it and I am unable to find any specimens in any herbarium.

BRAZORIA SCUTELLARIOIDES Engelm. & Gray. **MURRAY COUNTY:** open, rocky pastures in limestone of the Frank's Conglomerate formation in Cowpen Canyon on the Ellsworth Collings' Bar-C Ranch, Arbuckle Mountains, *Hopkins*, no. 6330.

This very attractive little annual with its lilac-pink flowers looks so much like a *Physostegia* that I at first mistook it for one. However, all the members of that genus are perennials and over

¹ *RHODORA* 40: 425–429. 1938.

² Which is not the correct name for the plant. The bibliography is essentially confused and *J. mexicana* is preoccupied. Until the correct name (or a new one) is found, the present epithet must suffice.

one foot high. This plant was scarcely 8 inches in height and had an annual root. Its identification adds another species to the state flora and also to that of the Arbuckle Mountains. As many times as I have botanized in those mountains in the spring, I have never happened to see this plant, much less to collect it. Yet on the day when I obtained it, the area was nearly carpeted with its pink flowers. It represents another extension northward from Texas where it occurs throughout the central and southern parts of that state. Only one specimen in the Gray Herbarium indicates the fact that it is a plant of calcareous soils, but in the Arbuckles it never grows anywhere except on limestone rocks.

GALIUM PROLIFERUM Gray. GREER COUNTY: damp soil, near Mangum, *Rothe Bull, sine numero*.

This specimen in the Bebb Herbarium was identified as *G. pilosum*. However, in checking the genus I was puzzled by the plant as well as several others resembling it superficially, and therefore took the entire lot to the Gray Herbarium for further study. This herbarium sheet is the only representative of the species in our Herbarium and, likewise, constitutes a new state record, not being previously found north of Texas where it occurs in the Trans-Pecos and Edwards Plateau areas (nos. 5 & 6 in Cory's Catalogue). Mangum is in extreme southwestern Oklahoma and possesses many plants of south Texas affinities in its rather diversified flora.

GALIUM TEXENSE IN OKLAHOMA.—In the Bebb Herbarium there are four specimens of this interesting species, variously identified as *G. proliferum*, *G. pilosum* and *G. virgatum*. While studying the material in the Gray Herbarium, it was obvious that they should all be referred to *G. texense* Gray, and therefore they constitute another new record for our flora, the plant having previously been unrecorded from north of Texas. Three of those specimens are from the Wichita Mountains in the southwestern part of the state¹; the other is from Mangum in Greer County (*Bull, sine numero*). Miss Bull wrote her thesis for the M.S. degree on the "Flora of Greer County" (unpublished) and although she is represented in the Bebb Herbarium by innumerable specimens, it is very unfortunate that she did not number all of

¹ *Mrs. J. Clemens*, no. 11,792, Fort Sill, Comanche Co.; *Waterfall*, no. 2923, in field among granite boulders near top of Mt. Scott, Wichita Mts., Comanche Co.; *Rothe Bull*, no. 47, Wichita Mts., Comanche Co.

them and that her descriptions of habitat were so sketchy. Greer County is adjacent to the Texas panhandle and Miss Bull's work is the only representation from that area, except for the collections from one trip made hastily in 1914 by the late G. W. Stevens.

UNIVERSITY OF OKLAHOMA
Norman, Oklahoma

A FLORA OF KENTUCKY.—It is a great pleasure to welcome to the growing array of state-floras one which assembles information on the distribution within the state of the flowering plants of Kentucky. Professor E. Lucy Braun¹ has given us her knowledge of local ranges and many critical comments. Divided between differing judgments of specific values, she has often avoided umpiring by following extended works on groups without noting dissenting evaluations. She thus accepts Hitchcock's Manual for the *Gramineae*; and all the members of *Panicum* for which she has found records appear, consequently, with no intimation that several close students have independently merged as one species, for example, *P. huachucae*, *Lindheimeri* and *tennesseense*, or, similarly, that in *Paspalum*, competent students have protested the keeping apart as species *P. circulare* and *P. laeve*. In these more technical groups the author has, obviously, not been in a position to decide. In groups more familiar to her she has made pertinent notes, like the failure of the leaves of the *Arisaema triphyllum* series to hold consistently to green or glaucous lower surfaces, or the ecological phases of *Aquilegia canadensis* failing to maintain their individuality when grown in similar habitats; and in a large number of cases, where no extended volume was leaned upon, recent critical studies of individual genera or species have been accepted. The citations in these cases greatly add to the reference-value of the *Catalog*. The great amount of collecting and of study of literature and the larger and older herbaria still to be done before the full content of the flora of the state is enumerated in one catalogue is evident from there being no mention of such weedy plants (found north, south, east and west of Kentucky) as *Camelina*, *Raphanus*, *Brassica* (except *nigra*) and *Erysimum cheiranthoides*, or of the weedy *Trifolium dubium*, which was sent to Asa Gray in 1855 by Short with the comment: "A volunteer in my garden and grass lots—never observed 'till this summer. Should be embraced among Kentucky plants." In *Trifolium*, furthermore, one misses any native species. They are doubtless local, but in the Gray Herbarium there are characteristic specimens from Kentucky of the native *T. reflexum* (three stations) and a fine specimen from Lexington, *Short*, of the native *T. stoloniferum*. In fact, both these natives were in Short's published *Catalogue* of 1833. In the first two-thirds of the *Archaeamyeae* one misses other noteworthy natives of Kentucky: *Stellaria fontinalis* (Short & Peter) Robinson, based on *Sagina fontinalis* Short & Peter from "cliffs of the Kentucky river and Elkhorn creek"; *Clematis glaucophylla*

¹ E. LUCY BRAUN. An Annotated Catalog of Spermatophytes of Kentucky. Copyright 1943 by E. Lucy Braun. Planographed. 161 pp.

Small (several stations represented in the Gray Herbarium); *Lesquerella globosa* (Desv.) S. Wats., generally identified with *Vesicaria Shortii* Torr. & Gray, the type of which came from "Banks of Elkhorn Creek, near Frankfort, Kentucky, *Short!*"; *Aplos Priceana* Robinson, one of Miss Price's notable discoveries in Warren County; and *Centrosema virginianum* var. *ellipticum* (DC.) Fernald, from Wayne County—see RHODORA, xliii. 588 (1941). These and other similar cases indicate the large amount of work yet to be done in drawing together the scattered items on the flora of Kentucky. The author of the present Catalog has the energy and enthusiasm. We may look hopefully for a fuller record of old, as well as new Kentucky collections from her pen.—M. L. F.

A CHECK-LIST OF KENTUCKY PLANTS.—Another catalogue of vascular plants of Kentucky has been published by Prof. Frank T. McFarland. It is only a check-list and makes no claim to be anything more.¹ Genera and species are arranged alphabetically under their families; no further data of any kind and no synonymy are given. It is, however, a good check-list. There has been an obvious and for the most part successful effort to take into account the results of recent taxonomic work. The list should be useful and reliable for any purpose which such a list can serve.

Neither Prof. Braun nor Prof. McFarland has been able to do much with the flora of western Kentucky, and both are conscious that their catalogues are far from complete. McFarland's is, to some extent, deliberately so: he has thought best to base his records on specimens in the herbaria of the University of Kentucky and the Kentucky Agricultural Experiment Station and to disregard unverified reports in literature. The result is that the two catalogues are reciprocally incomplete. McFarland's, for instance, includes the pteridophytes and most of the species noted by Prof. Fernald as omitted from Braun's; and Braun's contains, along with a good many recent discoveries of her own, presumably trustworthy reports from literature (like Mackenzie's records of *Carex Buxbaumii* and *C. comosa*) not noticed by McFarland. With the knowledge that the data back of McFarland's undocumented records exist in the herbaria which he used, the two catalogues can be used to supplement one another.—C. A. W.

¹ FRANK T. MCFARLAND. A Catalogue of the Vascular Plants of Kentucky. Reprinted, without change of pagination, from *Castanea*, vii. 77–108 (1942).

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CXLVIII

M. L. FERNALD

(Continued from page 258)

V. STUDIES IN NORTH AMERICAN SPECIES OF *SCIRPUS*

(Plates 762-767)

THE AMERICAN REPRESENTATIVE OF *SCIRPUS PUMILUS* (PLATES 762-764).—One of the rarest or most localized sedges of North America is the tiny plant with solitary terminal spikelet, belonging in *Scirpus*, § *Baeothryon* and passing for nearly forty years in America as the Eurasian *S. alpinus* Schleicher (1828) and subsequently as the identical *S. pumilus* Vahl (1806). First recorded as American by Britton in *Trans. N. Y. Acad. Sci.* xi. 75 (1892) as *S. alpinus* from the "Rocky Mountains", *Hall & Harbour*, and from Moreley in the Canadian Rocky Mountains, the species next attracted attention from its discovery on Anticosti Island and the adjacent Mingan Islands of Saguenay County, Quebec, and was the subject of one of the interesting articles by Marie-Victorin, in *Trans. Roy. Soc. Can.*, ser. 3, xxiii. pt. 2, sect. V. 25 (1929). Somewhat later, in *RHODORA*, xxxiii. 23, 24 (1931), I pointed out that the name *S. pumilus* Vahl antedates *S. alpinus* Schleicher and I then recorded additional stations in the Canadian Rocky Mountains; and more recently Beetle, in *Am. Journ. Bot.* xxviii. 421 (1941), has maintained *S. pumilus* as American: "Mountain meadows of Eurasia and North America", he citing American plants of Quebec (Anticosti and the Mingan Islands), Saskatoon, Saskatchewan, Alberta and Colorado. The habitat, "mountain meadows", while perhaps applying in the Rocky Mountains, is hardly appropriate for the Quebec area, with Anticosti rarely attaining a height of 175 m.¹ and the Mingan

¹ "les plus hautes plateaux cités par eux ne dépassent pas 150 et 175 metres"—Despêcher and Combes as quoted by Schmidt, *Monographie de l'Île d'Anticosti*, 10 (1904).

Another member of § *Baeothryon*, the flat-leaved woodland *Scirpus planifolius* Muell., is cited by Beetle, l. c. 174, from "VERMONT: Willoughby, W. Boott in 1863". William Boott's herbarium is incorporated in the Gray Herbarium. There is there no Vermont material of *S. planifolius* from him, and Kennedy and others who intimately knew the Willoughby region did not know it there. Dole lists it only from

Islands still lower, while Saskatoon is well to the east of the mountains, in the flat Canadian prairie.

Ever since Britton's identification of the Rocky Mountain plant with *S. alpinus* Schleicher or *S. pumilus* Vahl of central and southeastern Europe, eastward into Persia and central Asia, we have accepted the identification without question. The plants of Eurasia are at least two quite different species, or perhaps geographic varieties, while some of the Asiatic material, that of alpine regions (4305–5200 m.) of Tibet may be distinct. This Tibetan plant may well be *Isolepis oligantha* C. A. Meyer, *Mém. des Sav. Étrang. Pétersb.* i. 197, t. 1 (1831); but until some one who has more adequate material and who can study Meyer's Siberian type can check it, the Tibetan plant may wait.

True *Scirpus pumilus* of the alpine regions of south-central and -eastern Europe, thence into Persia and Siberia (our PLATE 762) is subcespitoso or quite densely cespitose (as shown by Reichenbach and others), with short stoloniferous offsets which promptly send up erect tufts of culms; the lowest scale of the spikelet often has the green midrib prolonged (FIGS. 3 and 4) as a green and blunt mucro; the anthers (FIGS. 2 and 3) have the connective prolonged as a distinct subulus; the achenes (FIGS. 6–8) are rather slenderly ellipsoid-obovoid, 1.6–1.8 mm. long, 0.4–0.5 mm. broad, subequilaterally trigonous (FIGS. 6 and 9) and usually broadly rounded to truncate at the sessile base; while all but the lowermost scales of the spikelet have thin scarious margins.

Fully 2100 km. to the north, within the Arctic Circle, there is a plant, occurring on Porsanger Fjord (south of Cape North) in northernmost Norway which is identified in current Scandinavian floras as *Scirpus pumilus*. This plant (PLATE 763, FIGS. 1–5) is extensively creeping, with very elongate filiform rhizomes and with small and scattered tufts of culms. Its anthers (FIG. 2) and achenes (FIG. 4) are like those of *S. pumilus*, except that the achenes are longer (2–2.2 mm. long); but its scales are much

two Vermont stations, Mt. Philo (Addison County) and North Pownal (Bennington County). It has also been collected in Arlington, Bennington County. These known stations are along the warm southwestern border of Vermont, not, like Willoughby, near the northeastern corner. It is probable that the Willoughby record of *S. planifolius* arose from *S. pauciflorus* Lightf., now usually treated as *Eleocharis pauciflora* (Lightf.) Link (var. *Fernaldii* Svenson) which abounds at Willoughby and was there collected by Wm. Boott in 1863.



Photo. B. G. Schubert.

SCIRPUS PUMILUS: FIG. 1, habit, $\times 1$; FIGS. 2-4, spikelet, $\times 4$; FIG. 5, disintegrated spikelet, showing broad scarious margin of scale, $\times 10$; FIG. 6, achene and its cross-section, after Schroeter; FIGS. 7 and 8, achenes, $\times 10$; FIG. 9, looking down upon summit of achene, $\times 10$.



Photo, B. G. Schubert.

SCIRPUS EMERGENS: FIG. 1, topotype, $\times 1$; FIG. 2, spikelet, $\times 10$; FIG. 3, disintegrated spikelet, showing firm scales, $\times 10$; FIG. 4, achene, $\times 10$; FIG. 5, looking down upon summit of achene, $\times 10$.

S. RUFUS: FIG. 6, achenes, $\times 10$.

S. RUFUS, var. *NEOGAEUS*: achenes, $\times 10$.

firmer and broader than in true *S. pumilus* and the latter have the margins hardly if at all scarious (FIG. 3). Furthermore the lowest scale (FIG. 2) is nearly like the others, without the green mucro strongly excurrent. Differing so markedly from typical *S. pumilus*, it was beautifully described as *Trichophorum emergens* Norman in Soc. Reg. Sc. Norveg. v. 319—repr. as Spec. Loc. Nat. 79 (1868)—and as abundant on the sandy inundated shore in Porsangria. “Vaginae basilares culmi ut in *Trichophoro caespitoso*, a quo rhizomate repente, stolonifero, fasciculos pauciculmeos immo culmos solitarios huc illuc emittente, recedit. Sub accessu maris inundatur, sub recessu emergit”. So different is this Finmark plant of inundated tidal shores from the more cespitose one of the southern alpine areas that it should certainly be kept apart.¹ Even the original editors of *Index Kewensis*, who did not hesitate to reduce species they did not understand, were baffled by *Trichophorum emergens*, appending after the citation “(Quid?)—Norveg.”

As stated and as shown in the plates, the anthers in the Eurasian *Scirpus pumilus* and *S. emergens* have prominently excurrent connectives and the achenes are subequilaterally trigonous, while in *S. pumilus* the lowest scale often has the midrib excurrent as a mucro; and the blunt scales of the arctic tidal-shore *S. emergens* are subcoriaceous and scarcely scarious-margined. When we turn to the North American plant (PLATE 764) which has passed as *S. pumilus* we find a habit midway between those of the two European species, the culms tufted, sometimes without but usually with slender and elongate rhizomes and scaly stolons. The American plant on superficial examination might easily be thought to stand somewhat intermediate between those of Eurasia. In our plant the scales of the spikelet are as thin as in *S. pumilus* but the lowest (FIGS. 2 and 3) has the midrib included, not exserted; the anthers (FIGS. 2 and 4) merely taper to tip, with the connective not exserted; and the achene (FIGS. 5–10) is plano-convex, broad and flat on the inner face, gently arching to merely umbonate on the back. The ripe achenes (FIGS. 5–7) are broadly ellipsoid-oblong, only 1.2–1.5 mm. long but 0.8–1.2 mm. broad, and gradually rounded to

¹ *SCIRPUS emergens* (Norman), comb. nov. *Trichophorum emergens* Norman in Soc. Reg. Sc. Norveg. v. 319—repr. as Spec. Loc. Nat. 79 (1868). PLATE 763, figs. 1–5.

base or sometimes substipitate. Differing in these minute but morphologically important characters from the Eurasian series, the North American plant is clearly an endemic species. Our fullest representation is the abundant series from Anticosti and the Mingan Islands, collected by Bros. Marie-Victorin and Rolland-Germain. I am greatly pleased to have this opportunity to associate with a plant of that area the name of a modest and self-effacing botanist who has done much in his earnest and discriminating way to bring to our knowledge the rarer plants of Quebec, Brother Rolland-Germain.

SCIRPUS (§ BAEOTHRYON) **Rollandii**, sp. nov. (TAB. 764).
Planta habitu foliis culmisque ut in *Scirpo pumilo* sed valde stolonifera; culmis laxe cespitosis vel subsolitariis; spiculis ellipsoideo-ovoideis 3-4 mm. longis, subteretibus; squamis ovatis obtusis vel subacutis brunneis vel rufescensibus subcoriaceis margine scariosis; antheris 1.5 mm. longis apice attenuatis; achaeniis nigrescentibus late oblongo-ellipticis, 1.2-1.5 mm. longis 0.8-1.2 mm. latis, plano-convexis dorso leviter convexo vel umbrinato.—QUEBEC: Archipel de Mingan: rivages calcaires, Ile Sainte-Geneviève, 9 août, 1925, Victorin & Rolland, no. 20,220; corniches calcaires du côté du large, Ile Sainte-Geneviève, 22 juillet, 1926, Victorin & Rolland, no. 25,785 (TYPE in Herb. Gray.); rivages calcaires, Ile à Marteau, 23 juillet, 1926, Victorin & Rolland, no. 25,940; parties élevées et découvertes surtout dans les sentiers de renard, Grande Ile à la Vache Marine, 19 juillet, 1926, Victorin & Rolland, no. 25,782; tundra calcaire parmi les Ericacées et les *Salix* nains, Grande Ile à la Vache Marine, 3 août, 1928, Victorin & Rolland, no. 28,374. Anticosti: sur les platières argilo-calcaires au-dessus des gorges, Rivière Chicotte, 15 août, 1925, Victorin & Rolland, no. 25,783; sur les platières à plusieurs milles en haut des gorges, Rivière Chicotte, 24 juillet, 1927, Victorin & Rolland, no. 27,517; sur les platières avec divers *Antennaria*, 19 août, 1926, Victorin & Rolland, no. 25,784; sur les platières en haut des gorges, Rivière au Fusil, 20 juillet, 1927, Victorin & Rolland, no. 27,518; sur les platières près de la mer, 25 juillet, 1927, Victorin & Rolland, no. 27,516; éboulis argilo-calcaire, le long de la mer, à l'est de la rivière, Rivière la Loutre, 6 août, 1926, Victorin & Rolland, no. 25,781. SASKATCHEWAN: depressed alkaline bog, Sutherland, Saskatoon, June 1, 1938, and July 24, 1939, W. P. Fraser. ALBERTA: marsh, Devil's Lake, alt. 4600 ft., Banff, July 5, 1907, Butters & Holway, no. 50. COLORADO: "Rocky Mt. Alpine Flora, Lat. 39°-41°", 1862, Hall & Harbour, no. 583.

PLATE 762 shows details of *SCIRPUS PUMILUS* Vahl: FIG. 1, habit, $\times 1$, from Prov. Semipalavitsk, western Siberia, May 21, 1920, O. Simonova &

T. Batueva; FIG. 2, spikelet, $\times 10$, from same collection; FIG. 3, spikelet, $\times 10$, from Mont Cenis, Savoie, July 27, 1855, *Perrier*; FIG. 4, spikelet, $\times 10$, from *Simonova & Batueva*; FIG. 5, disintegrated spikelet, showing broad scarious margin of scale, $\times 10$, from Zermatt, July, 1882, *Christ*; FIG. 6, achene and its cross-section, after *Schroeter*, *Pflanzenl. der Alpen*, fig. 174 (1923); FIG. 7, achene, $\times 10$, from Mont Cenis, *Perrier*; FIG. 8, achene, $\times 10$, from Zermatt, *Christ*; FIG. 9, looking down on summit of achene, $\times 10$, from Zermatt, *Christ*.

PLATE 763, FIGS. 1–5. *S. EMERGENS* (Norman) Fernald: FIG. 1, habit, $\times 1$, from Porsangar Fjord, Finnmark, July 9, 1898, *A. L.*; FIG. 2, spikelet, $\times 10$, from same collection; FIG. 3, disintegrated spikelet, showing firm scales, $\times 10$, from Borsfjord, Porsanger, August 15, 1899, *Ove Dahl*; FIG. 4, achene, $\times 10$, from *Dahl*; FIG. 5, looking down on tip of achene, $\times 10$, from *Dahl*. FIG. 6, *S. rufus* (Huds.) Schrad.: achenes, $\times 10$, from Skåne, Sweden, July 14, 1928, *Erik Asplund*. FIG. 7, *S. rufus*, var. *neogaeus*: achenes, $\times 10$, from the TYPE.

PLATE 764, *S. ROLLANDII* Fernald: FIG. 1, habit, $\times 1$, from the TYPE; FIGS. 2 and 3, spikelets, $\times 10$, from TYPE; FIG. 4, disintegrated spikelet, showing anthers, $\times 10$, from TYPE; FIG. 5, achene, $\times 10$, from Ile à la Vache Marine, Archipel de Mingan, Quebec, *Victorin & Rolland*, no. 28,374; FIG. 6, achene, $\times 10$, from Rivière Chicotte, Anticosti, *Victorin & Rolland*, no. 27,517; FIG. 7, achene, $\times 10$, from Saskatoon, Saskatchewan, July 24, 1939, *W. P. Fraser*; FIG. 8, looking down on tip of achene in fig. 5, $\times 10$; FIG. 9, similar view, $\times 10$, of achene in fig. 6; fig. 10, similar view, $\times 10$, of achene in FIG. 7.

SOME NORTH AMERICAN MEMBERS OF *SCIRPUS*, § LACUSTRES (PLATES 765 and 766).—

SCIRPUS VALIDUS Vahl, var. *creber*, var. nov. (TAB. 765, FIG. 4–7), spiculis ovoideis 5–9 mm. longis; squamis costa margineque exceptis glabris lucidis achaenio maturo vix superantibus; antheris deinde subulato-appendiculatis; perianthio achaenium subaequante; achaeniis 1.7–2.5 mm. longis 1.3–1.5 mm. latis.—Newfoundland to British Columbia, south to Nova Scotia, New England, Long Island, Georgia, Tennessee, Missouri, Oklahoma, Texas, New Mexico, northern Mexico and California. TYPE: salt-marsh, Fisher's Island, New York, August 10–15, 1920, *Harold St. John*, no. 2581 (in Herb. Gray.).

Forma *megastachyus*, f. nov. (TAB. 765, FIG. 8), spiculis lineari-cylindricis 9–15 mm. longis; achaeniis 2.3–2.8 mm. longis 1.4–1.8 mm. latis.—Scattered through the range of var. *creber*; the following are characteristic. NOVA SCOTIA: Truro, *Fernald & Wiegand*, no. 2720. MAINE: Lincolnville, *G. B. Rossbach*, no. 238. MASSACHUSETTS: York Pond, Canton, July 8, 1894, *Kennedy*; Eastham, *F. S. Collins*, no. 1293; Wakeby Pond, Sandwich, September 16, 1916, *Harger & Woodward*. CONNECTICUT: East Windsor, August 21, 1904, *Bissell*. VIRGINIA: west of Toano, James City County, *R. W. Menzel*, no. 89. MICHIGAN: New Buffalo, *Lansing*, no. 3281. IOWA: Lost Lake Township, Clay County, *Ada Hayden*, no. 9195. NORTH DAKOTA: Mandan, *F. P. Metcalf*, no. 374. NEBRASKA: St. Paul, July 24, 1909, *J. M. Bates*. KANSAS: Joy Creek, Osborne County, July 11, 1894,

Shear, no. 239 (TYPE in Herb. Gray.); Riley Co., June 21, 1895, *J. B. Norton*. TEXAS: Dallas Co., July, 1877, *Reverchon*; El Paso County, *Cory*, no. 1255. ALBERTA: Cree (Mamawi) Creek, Wood Buffalo Park, *Raup*, no. 1980. OREGON: St. Paul, *J. C. Nelson*, no. 1692; Salem, *Nelson*, no. 3307.

Scirpus validus (PLATE 765, FIGS. 1-3) was described by Vahl, *Enum. ii.* 268 (1806), its "Habitat in Caribaeis", with a clear diagnosis and a remarkably complete description, he distinctly saying "squamis dorso villosis". It is the plant of eastern tropical America¹ which differs at once from the common plant of the United States and Canada in several points. Its inflorescence (FIG. 1) is usually stiffer than in the common North American plant, only exceptionally with arching and pendulous rays and pedicels, although the more northern plant may have the inflorescence as stiff as in *S. acutus* Muhl. Typical *S. validus* may, as originally described, have the scales of the spikelets villous or they may be glabrescent or even glabrous except for the keel and the fimbriate-ciliolate margin. In none of the tropical and subtropical American material do the achenes show beyond the scales; the scales strongly cover them and are nearly twice as long. The perianth consists of very delicate bristles remotely retrorse-setulose chiefly above the basal third and commonly overtopping the achene. The connective of the anther (FIGS. 2 and 3) projects as a triangular-ovate sessile tip, though sometimes becoming elongate. North of tropical America true *S. validus* is frequent or common in Florida and there is material in the Gray Herbarium with the stereotyped and possibly too inclusive label "Santee Canal, South Carolina, *Ravenel*".

From genuine tropical and subtropical *Scirpus validus* our var. *creber* differs in its often more lax inflorescence (FIGS. 4 and 5), the backs of the scales glabrous, the scales barely covering or when they are ripe (FIG. 5) not wholly covering the achenes; the perianth (FIG. 7) of usually coarser and rather shorter bristles which are copiously retrorse-setose; and the anther (FIG. 6) with the slender tip becoming prolonged. Some material from the southeastern states and some from Bermuda is so transitional

¹ The citation by Beetle in *Am. Journ. Bot.* xxviii. 695 (1941) of Bermuda, Haiti, Porto Rico, Jamaica and Cuba as the "EAST INDIES" and his statement of broad range (p. 693), "common throughout North America, and bordering the Pacific basin", with the only South American specimens cited coming from Uruguay and Argentina, suggest need of more precise knowledge of geography.

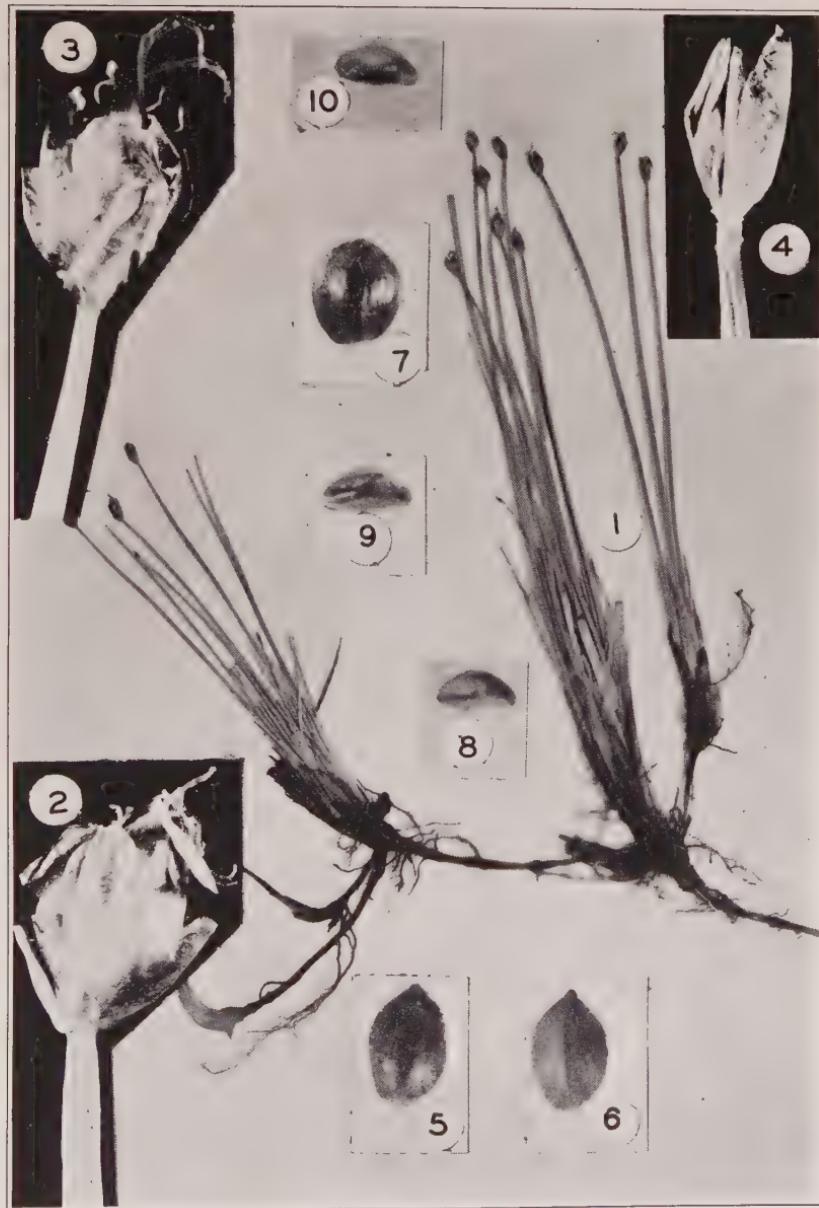


Photo. B. G. Schubert.

SCIRPUS ROLLANDII: FIG. 1, type, $\times 1$; FIGS. 2 and 3, spikelets of type, $\times 10$; FIG. 4, disintegrated spikelet from type, showing anthers, $\times 10$; FIGS. 5-8, achenes, $\times 10$; FIGS. 9-10, looking down upon summits of achenes, showing plano-convex outline, $\times 10$.



Photo. B. G. Schubert.

SCIRPUS VALIDUS: FIG. 1, inflorescence, $\times 1$; FIG. 2, spikelet, $\times 5$; FIG. 3, achene and elongate bristles, $\times 10$.

Var. *CREBERI*: FIG. 4, inflorescence of type, $\times 1$; FIG. 5, mature spikelets, showing protruding achenes, $\times 5$; FIG. 6, flowering spikelets, $\times 5$; FIG. 7, achene and subequal bristles, $\times 10$.

Var. *CREBERI*, FORMA *MEGASTACHYUS*: FIG. 8, inflorescence of type, $\times 1$.

that I am treating the common plant of the United States and Canada as a strong geographic variety, rather than as a species. In its prolonged and linear-cylindric spikelets up to 1.5 cm. long var. *creber*, forma *megastachyus* (FIG. 8), when its inflorescence is contracted, might be mistaken for *S. acutus*. In fact, by the recently published key to species of this section ("Spikelets ovoid . . . *S. validus*"; "Spikelets subcylindric . . . *S. acutus*")¹ and the accompanying descriptions ("spikelets 5–10 mm. long, . . . ovate" for *S. validus*; "spikelets 0.7–2 cm. long, . . . ovate-acute to cylindrical" for *S. acutus*) one could hardly place most specimens under *S. validus*; nevertheless several specimens, including the type, of forma *megastachyus* were cited as good *S. validus*. Accompanying the elongation of spikelet the achene of forma *megastachyus* is enlarged, achenes from the form running considerably larger than in typical var. *creber*.

In connection with *Scirpus validus*, var. *creber* two names have to be considered, because they are cited by Beetle as synonyms under his all-inclusive *S. validus*. These are *S. orgyalis* Raf. Annals of Nature [not "Amer. Nat." as cited in the recent paper], 16 (1820) and *S. lacustris*, var. *condensatus* Peck, N. Y. State Mus. Rep. no. 53: 853 (1900). Rafinesque's *S. orgyalis* of "creeks and rivers of New York and Pennsylvania", had little of specific character in the brief description except "spikes lateral under the apex, glomerated, ovate, sub-sessile; scales ovate, mucronate, brown, arachnoidal". What he had we do not know. He intended his name to apply to anything North American of the *lacustris* group. The "glomerate . . . sub-sessile" spikes with "arachnoidal" scales could as well, if not better, apply to *S. acutus* Muhl. (1842) which occurs in New York and western Pennsylvania and which often has villous scales, while those of the *S. validus* of that region have the scales glabrous except for keel and margin.

Peck was not differentiating between the three species of § *Lacustris* which occur in New York State. His "***S. lacustris condensatus* n. var.**" was described: "Heads of the panicles sessile or on very short pedicels, forming a dense cluster about 1 inch long and broad. Otherwise as in the common form. Lime

¹ Beetle, l. c. 692 (1941).

Lake. August. F. E. Fenno." According to House, N. Y. State Mus. Bull. no. 254: 147 (1924) the Fenno plant is *S. heterochaetus*, a species which usually has a lax and open panicle and which differs from *S. validus* in its very pale and solitary spikelets, its trigonous achene, etc. Even if *S. lacustris condensatus* were an unusual form of *S. validus* it would be quite ridiculous to take up the name, intended for a trivial form, for the transcontinental plant with open and loosely forking panicles. Extreme literalists might do so, but the intent of the original author was obvious; the rules of nomenclature were not intended to foster absurdity, if they do, it is time to change them.

***S. Steinmetzii*, sp. nov. (TAB. 766, FIG. 1-7).** Planta statura habituque ut in *Scirpo heterochaeto*; spiculis ellipsoideo-ovoideis obtusis 5-7.5 mm. longis 4-5 mm. crassis fulvis; squamis scarioso-membranaceis fulvis acuminatis glabris, margine apiceque villoso-ciliatis, aristo breve; antheris apice triangulari-ovatis; stylo 2-partito; achaeniis plano-convexis albescentibus elliptico-ovatis vel subrotundatis 2.5-2.8 mm. longis; setis 1 vel 2 vel 0 tenuissimis brevibus.—MAINE: bank and shore of sluggish stream, Passadumkeag Stream, Passadumkeag, Penobscot County, August 12, 1937, F. H. Steinmetz, no. 355 (TYPE in Herb. Gray.; ISOTYPE in Herb. Univ. of Maine), September 1, 1938, Steinmetz, July 29, 1942, Steinmetz & Gashweiler, specimens originally and tentatively placed with *S. heterochaetus* Chase; shallow water near shore of river, Passadumkeag River at Hathaway Bridge, Passadumkeag, August 5, 1940, Ogden & Wright, no. 2345.

Scirpus Steinmetzii, with which it is a great pleasure to associate the name of the leader of botanical exploration in Maine and discoverer of the plant, is like *S. heterochaetus* only in having a prolonged basal leaf and in its lax inflorescence with no tendency to the formation of glomerules. *S. heterochaetus* has slender pale green to whitish-brown lanceolate to slenderly ellipsoid acute or subacute spikelets 0.75-2.3 cm. long; its pale scales are firm to subcoriaceous and deeply emarginate at tip; its styles mostly 3-cleft, its achenes trigonous. It is a species of calcareous or alkaline waters; and it was beautifully illustrated by Mrs. Chase when she published it in *RHODORA*, vi. 70, t. 53, fig. d (1904). *S. Steinmetzii*, on the other hand, has the reddish to purple-brown plump-ovoid obtuse spikelets only 5-7.5 mm. long; the thin and almost scariosus scales tapering to the awn

(not deeply emarginate) and heavily villous-ciliate (rather than slightly or hardly so) at margin; the style is 2-cleft and the strongly flattened achene plano-convex, merely slightly convex on the back. It should, therefore, be confidently watched for in the extensive lake-strewn area which extends from the Penobscot across Hancock and Washington Counties, Maine, into southwestern New Brunswick.

From *Scirpus validus*, var. *creber* the newly described *S. Steinmetzii* is distinguished by its non-globose spikelets, the scales greatly overtopping the achenes (as in tropical *S. validus*), but with tapering (rather than broadly rounded and emarginate) tip, the anther-connective with a triangular sessile terminal appendage, the bristles fewer and short or wanting, and the persistent old filaments very broad and ribbon-like.

In PLATE 765, FIGS. 1-3 are of typical *SCIRPUS VALIDUS* from Cordillera Septentrional, prov. Puerto Plata, Sabaneta, in Caño Hondo, Civ. Santo Domingo, Hispaniola, *Ekman*, no. 14,549: FIG. 1, inflorescence, $\times 1$; FIG. 2, spikelet, showing blunt anther, $\times 5$; FIG. 3, achene, showing elongate bristles and an anther, $\times 10$. FIGS. 4-7, var. *CREBER*: FIG. 4, inflorescence of TYPE, $\times 1$; FIG. 5, mature spikelets, showing protruding achenes, $\times 5$, from Litchfield, New York, *Haberer*, no. 2228; FIG. 6, flowering spikelets, showing apiculate anthers, $\times 5$, from Dixville Notch, New Hampshire, July 27, 1895, *E. F. Williams*; FIG. 7, achene, showing bristles, from TYPE, $\times 10$. FIG. 8, inflorescence of TYPE of var. *CREBER*, forma *MEGASTACHYUS*, $\times 1$.

In PLATE 766 FIGS. 1-7 are of *SCIRPUS STEINMETZII*, all from the TYPE series: fig. 1, inflorescences, $\times 1$; FIG. 2, axis of inflorescence, $\times 3$; FIGS. 3 and 4, spikelets, showing long scales and blunt anthers, $\times 5$; FIGS. 5 and 6, achenes, with single perianth-bristle and broad filaments, $\times 10$; FIG. 7, achene viewed from above (looking down on beak), $\times 10$. FIGS. 8-10, *S. HETEROCHAETUS*, from Selkirk, Oswego County, New York, *Fernald, Wiegand & Eames*, no. 14,192: FIG. 8, spikelets, $\times 5$; FIG. 9, achene, $\times 10$; FIG. 10, achene, viewed from above, $\times 10$.

SOME AMERICAN SPECIES AND VARIETIES OF *SCIRPUS* (PLATES 763, figs. 6 and 7, and 767).—*SCIRPUS RUFUS* (Huds.) Schrad., var. *neogaeus*, var. nov. (TAB. 763, FIG. 7), achaeniis fusiformi-lanceolatis 4.5-5.5 mm. longis 1-1.7 mm. latis valde stipitatis rostratisque.—Saline to brackish, rarely fresh marshes, Newfoundland and shores of Gulf of and lower River St. Lawrence, Quebec, south to southwestern Nova Scotia and southwestern New Brunswick; salt marshes from Churchill to Red Deer River, lat. 53°, Manitoba. TYPE: near Hospital Point, Grindstone Island, Magdalen Islands, July 18, 1912, *Fernald, Bartram, Long and St. John*, no. 6968 (in Herb. Gray.).

In habit, foliage, spikes and spikelets the American material of *Scirpus rufus* (*Blysmus rufus* (Huds.) Link) is quite like the plant of northern Europe and it shows the same diversity of

involucre, oftenest with it essentially obsolete or reduced to a short blade but occasionally with a long blade overtopping the compound spike. The European descriptions very generally define the achene as elliptic and of a yellow-gray color. There being no reason in European works for further detail the size is not often given. Holmberg, however, in his very detailed and unfortunately never completed Scandinaviens Flora, Hafte 2: 304 (1926) says "Nöt spolformigt [fusiform] elliptick . . . 3 mm. läng, 1,5 mm. bred, gul-1. brungrå." The achenes of the European plant (PLATE 763, FIG. 6) range from 3-4.5 mm. long, with the rather definitely elliptic body usually about 3 mm. long and 1.5-2 mm. broad and opaque to barely sublustrous. The achene of the American plant is more definitely fusiform, 4.5-5.5 mm. long, lustrous and of slightly warmer color, the body only 1-1.7 mm. broad, the stipe and beak more prolonged than in the European plant. FIG. 6 shows achenes, $\times 5$, of typical *S. rufus* from Skåne, Sweden, July 14, 1928, Erik Asplund; FIG. 7, achenes, $\times 5$, from the TYPE of var. *neogaeus*.

S. SUBTERMINALIS Torr., forma *terrestris* (Paine), comb. nov.
Var. *terrestris* Paine, Cat. Pl. Oneida Co., 96 (1865).

S. MARITIMUS L., var. *FERNALDI* (Bicknell) Beetle, forma **agonus**, culmis ad 1.5 m. altis et 1.3 cm. crassis; foliis ad 15 mm. latis; spiculis 1.2-4 cm. longis; achaeniis late vel subrotundo-obovatis ad basin sensim rotundatis plerumque 2.5-3.2 mm. latis plano-convexis vel lenticularibus dorso sensim rotundatis.—
Saline or brackish marshes and fresh tidal shores, Cape Breton, Magdalen Islands, Prince Edward Island and eastern New Brunswick, south to Connecticut. The following belong here.
QUEBEC: shallow water near margins of brackish ponds southwest of Étang du Nord village, Grindstone Island, Magdalen Islands, *Fernald*, *Long & St. John*, no. 6986. PRINCE EDWARD ISLAND: border of salt marsh, Mt. Stewart, *Fernald*, *Bartram*, *Long & St. John*, no. 6980; salt marsh, Bunbury, *Fernald*, *Long & St. John*, no. 6987. NOVA SCOTIA: salt marsh at head of Baddeck Bay, Victoria Co., *Fernald & Long*, no. 20,215; edge of brackish marsh, Sable Island, *St. John*, no. 1160; near brackish mouth of Salmon River, Truro, *Fernald & Wiegand*, nos. 4248 and 4249; border of salt marsh, Jordan Falls, Shelburne County, September 4, 1921, *Fernald & Long*, no. 23,398 (TYPE in Gray Herb., distrib. as *S. campestris*, var. *novae-angliae*). NEW BRUNSWICK: brackish marsh, Bathurst Bay, Bathurst, *S. F. Blake*, no. 5457; marsh, Bay du Vin Island, Northumberland County, *Blake*, nos. 5706 and 5707; border of brackish pond,



Photo. B. G. Schubert.

SCIRPUS STEINMETZII, all figs. from type: FIG. 1, inflorescences, $\times 1$; FIG. 2, axis of inflorescence, $\times 3$; FIGS. 3 and 4, spikelets, $\times 5$; FIGS. 5 and 6, achenes, each with single bristle, $\times 10$; FIG. 7, achene viewed from above, $\times 10$.

S. HETEROCHAETUS: FIG. 8, spikelets, $\times 5$; FIG. 9, achene, $\times 10$; FIG. 10, achenes viewed from above, $\times 10$.



Photo. B. G. Schubert.

SCIRPUS EXPANSUS, all figs. from type: FIG. 1, inflorescence, $\times \frac{1}{4}$; FIG. 2, portion of inflorescence, $\times 3$; FIG. 3, spikelets, with anthers, $\times 10$.

S. SYLVATICUS: FIG. 4, small portion of inflorescence, $\times 3$; FIG. 5, spikelets, with anthers, $\times 10$.

Whale Cove, Grand Manan Island, *C. A. & Una F. Weatherby*, no. 5609. MAINE: salt marsh toward Dennisville, Pembroke, *Fernald*, no. 1414; brackish shores, Pleasant River, Columbia Falls, *Svenson & Fassett*, no. 1005; muddy shore of Herrick's Bay, Flye's Point, Brooklin, *A. F. Hill*, no. 1345; fresh or slightly brackish border of salt marsh, South Thomaston, *Bissell, Fernald & Chamberlain*, no. 8933; wet rocky shore, Matinicus, July 19, 1919, *C. A. E. Long*; sandy salt marsh, Bristol, *E. B. Chamberlain*, no. 695, *Dinsmore & Chamberlain*, no. 839; salt marsh, Bath, August 23, 1911, *Bissell*; Foster's Point, West Bath, 1892, *Kate Furbish*; salt marsh, Hardings', Brunswick, September 13, 1891, *Kate Furbish*, September 27, 1898, *Chamberlain*, no. 936; Kennebunkport, August 7, 1888, *Kennedy*; mouth of York River, York, *Bicknell*, no. 1156, *Fernald & Long*, no. 12,845. NEW HAMPSHIRE: ditch near border of salt marsh, Hampton Falls, August, 1898, *A. A. Eaton*. MASSACHUSETTS: Manchester, *H. D. Thoreau*; salt marsh, West Manchester, *F. T. Hubbard*, no. 73; Somerville, 1882, *C. E. Perkins*; Watertown, July 17, 1880, *C. E. Perkins*; salt marsh, Scituate, September 8, 1901, *W. P. Rich*, September 13, 1914, *C. H. Knowlton*; swale, West Barnstable, *St. John & White*, no. 941. CONNECTICUT: salt marsh, Milford, *E. H. Eames*, no. 39.

Scirpus maritimus, var. *Fernaldi*, forma *agonus*, is the eastern North American plant treated by Beetle in Am. Journ. Bot. xxix. 84, 85 (1942) as typical *S. maritimus* of Europe. It is quite like *S. maritimus*, var. *Fernaldi* (Bicknell) Beetle, l. c. 85, except in having bifid styles and thin plano-convex to lenticular achenes. Throughout the range of var. *Fernaldi*, with trigonous achenes, and its forma *agonus* the two show the same range of variation in spikelets and habit, with a dense glomerule or more commonly with well developed rays, with the latter terminated by single to several and glomerulate spikelets, with the spikelets short and ovoid as in the type of *S. Fernaldi* Bickn. or slender and lance-cylindric, running up to 4 cm. or more long, as in the type of *S. novae-angliae* Britton. Both *S. Fernaldi* and *S. novae-angliae* were based upon specimens with trigonous achenes; and in that series as well as in the one with plano-convex or lenticular and relatively thin achenes there is no line of demarcation evident by which the plants with ovoid and lance-cylindric spikelets can be separated. *S. novae-angliae* was published as a species in 1898, *S. Fernaldi* in 1901. In the varietal rank they are of identical date, published in RHODORA, viii. 163 (1906) as *S.*

campestris, var. *novae-angliae* (Britton) Fern. and var. *Fernaldi* (Bicknell) Bartlett, but since the latter was transferred to *S. maritimus* as var. *Fernaldi* while Beetle considered *S. novae-angliae* to be a variety of *S. robustus* Pursh, *S. robustus*, var. *novae-angliae* (Britton) Beetle, l. c. 87 (1942), they are again of even date. Under these circumstances it seems less disturbing to maintain under *S. maritimus* the first of the two which was treated as a variety of that species.

It is not clear to me why Beetle places *Scirpus novae-angliae* under *S. robustus*. The latter species is a beautifully distinct one of tropical America, following the Atlantic coast northward to Massachusetts, the Pacific to California. Its plump ellipsoid-ovoid to thick-cylindric blunt or bluntnish spikelets are rufescent or fulvous, the scales (especially the outer) with very prolonged awns. Its leaf-sheaths have very characteristic orifices, the strong ribs running up the summit to the semicircular or prominently convex dark scariosus ligule. *S. novae-angliae*, on the other hand, like European *S. maritimus* and American *S. Fernaldi*, has the ligule V-shaped, with truncate or concave (rarely low-convex) summit and the nerves at the summit of the sheath are slender and relatively inconspicuous. The ovoid to lance-cylindric acute to acuminate spikelets are, as in *S. maritimus*, castaneous to fuscous or blackish, and the awns of the scales are relatively short.

From typical European *Scirpus maritimus*, our var. *Fernaldi* is distinguished merely on size, the leaves running higher on the culm, and upon a slight difference in shape of achene. Our plant is usually taller and coarser, with leaves mostly 6–15 mm. broad (as opposed to the “ \pm 4 (7)” —Hegi, of the European); the spikelets of ours are 1.2–4 cm. long (“bis 2 cm. lang” in *S. maritimus* —Hegi); and the achenes are generally more broadly obovate and more gradually rounded to the broad base, as opposed to the narrower-obovate achene of *S. maritimus* in which they taper more cuneately or even with a slight concave curve to the slender base.

I do not know how Beetle arrived at the conclusion that true (Eurasian) *Scirpus maritimus* has “Style normally 2-fid” (Beetle, l. c. 87), for the consensus of statements of European taxonomists makes the 2-fid style very exceptional: “a typicus

“. . . Narben 3”—Ascherson & Graebner; “Stigmates 3 (rar^t 2 . . .)”—Rouy; “Stigmas 3, or rarely 2”—Babington; “Style 3-cleft”—Bentham; “Narben 3, seltener 2”—Hegi. Although true *S. maritimus* (with 3 stigmas and trigonous achenes) is in Europe the common form, while the so-called var. *digynus* (Simonk.) Godr. is there called rare, with us typical var. *Fernaldi* (with trigonous achenes) and its forma *agonus* are about equally common. At least, in the area from the Gulf of St. Lawrence to Connecticut, where the two somewhat alternate their colonies, the representation before me shows 51 sheets of typical var. *Fernaldi* (including *S. novae-angliae*) and 58 of forma *agonus*. Within this area the two are about equally common; from New York to Virginia the representation before me is all of typical var. *Fernaldi*.

S. paludosus Nels., var. **atlanticus**, var. nov., a forma typica recedit foliis caulinis plerumque 2–4, sub medio gestis, vaginae venis apice tenuibus vix prominulis; spiculis brunneo-castaneis vel fusco-nigrescentibus; antheris plerumque 2–3.5 mm. longis, filamentis inclusis vel subexsertis; achaeniis rotundo-ovovatis vel suborbicularibus rariter cuneatis olivaceis vel atro-brunneis.—Salt marshes and saline shores, Gulf of and lower River St. Lawrence, Quebec, to northern New Jersey; central and western New York. TYPE: salt marsh, Bunbury, Prince Edward Island, August 28, 1912, *Fernald, Long & St. John*, no. 6982 (in Herb. Gray.).

Scirpus paludosus Nels. in Bull. Torr. Bot. Cl. xxvi. 5 (1899), like the identical *S. campestris* Britton in Britt. & Brown, Ill. Fl. i. 267, fig. 626 (1896), not Roth (1795), is the plant of western North America, extending eastward to Manitoba, Minnesota, Nebraska and Missouri. Var. *atlanticus* is the plant of the Atlantic coast, with an isolated and in some ways transitional area in the saline region of interior New York. True *S. paludosus* is a very pale green plant, with culms mostly 0.5–2 cm. thick at base and 0.5–1.5 m. high; the caudine leaves mostly 3–5 (–6), with sheaths ascending well above the middle of the culm (but in starved colonies the culms lower and the leaves fewer and borne chiefly below the middle), their blades mostly 0.5–1.5 cm. broad, the veins near the orifice of the sheath prominent and usually thickened; spikelets whitish-brown to drab or pale brown; anthers 3.5–5 mm. long, standing well out of the spike-

lets on elongate filaments, the filaments, after falling of anthers, usually showing above the scales and twice to thrice the length of the achene; achene cuneate-ovate, rarely roundish, pale brown to olivaceous.

S. paludosus, var. *atlanticus* is not so pale; its culms are 1.5–7.5 dm. high, 2–8 mm. thick at base; the caudine leaves are usually 2–4 and borne chiefly below the middle (though in exceptional plants, perhaps mixed with *S. maritimus*, var. *Fernaldi*, more numerous and running high on the culm), the blades 1.5–9 mm. broad, the veins near summit of sheath delicate and inconspicuous; spikelets chestnut-brown to blackish-fuscous; anthers 2–3.5 mm. long, mostly not exceeding scales, the old filaments rarely exserted and shorter than to about twice the length of the achene; the achene rounded-ovate to suborbicular, only exceptionally cuneate, olivaceous to deep brown. In central and western New York the plant geographically somewhat intermediate between true *S. paludosus* and var. *atlanticus* has the anthers up to 4 mm. long and the achene often cuneate at base. Along the coast of the Gulf of St. Lawrence and of the Atlantic occasional colonies seem like hybrids of *S. paludosus*, var. *atlanticus* and *S. maritimus*, var. *Fernaldi*.

True western *Scirpus paludosus* has an evident tendency to branching of the inflorescence; var. *atlanticus* not. Of the 186 inflorescences of *S. paludosus* before me 124 have simple or at least closely crowded glomerules, 62 (33%) have 1 or 2 (rarely 3 or 4) obvious elongate rays. Of 420 inflorescences of var. *atlanticus* only 20 (less than 4%) show a single (in 1 case 2) short ray. On the Atlantic coast the plant with fuscous spikelets frequently on definite or elongate rays is *S. maritimus*, var. *Fernaldi*. Of the 210 inflorescences of it before me 172 (nearly 82%) have definite (sometimes forking) rays (26 with 1 ray, 77 with 2, 28 with 3, 20 with 4, 13 with 5, 13 with 6, 6 with 7, 5 with 8, 1 with 11, 1 with 12 and 4 with 13).

Although Beetle in Am. Journ. Bot. xxix. 83 (1942) cites *Scirpus paludosus* as occurring in the "EAST INDIES: Ekman 1325" (this citation placed between New Jersey and Minnesota), there is grave doubt about it. I have not seen no. 1325 and can, consequently, not check its identity; at least, it presumably came from the *West Indies*.

S. expansus, sp. nov. (TAB. 767, FIG. 1-3), planta habitu *S. sylvatici*; culmo 0.5-1.6 m. alto ad basin 0.6-1.5 cm. crasso superne scabro; foliis 1-2.5 cm. latis, vaginis coriaceis valde septato-nodulosis; involucri foliis 3-8, imis panicula superantibus; panicula 1-3 dm. alta radiis adscendentibus vel divaricatis; pedicellis valde pilosis; spiculis 3-5 mm. longis, plerumque glomerulatis; squamis valde carinatis apice subulatis; antheris 1.3-1.6 mm. longis.—Spring-heads, borders of rills, springy meadows, swales, etc., southwestern Maine to southern Michigan, south to Georgia. The following, selected from a large series, are representative. MAINE: South Poland, 1895, *Kate Furbish*; *Typha* swamp, bank, Presumpscot River, August 13, 1903, *Collins & Chamberlain*, no. 614 (TYPE in Herb. Gray.); springy spot, Great Chebeague Island, *Fernald*, no. 1401; swale at border of salt marsh, Wells, *Fernald & Long*, no. 12,851; swamp, York Harbor, July 22, 1901, *F. T. Hubbard*. NEW HAMPSHIRE: Hanover, August, 1878, *Jesup*; Ore Hill, Warren, July 26, 1910, *E. F. Williams*; shore of Johnson Creek, Madbury, *Hodgdon*, no. 2629. VERMONT: Gulf Brook swamp, Townshend, September 10, 1912, *L. A. Wheeler*. MASSACHUSETTS: south end of Horn Pond, Woburn, August 4, 1869, *Wm. Boott*; South Sudbury, June 17, 1902, *Rich, Fernald & Williams*; Westfield, July 10, 1860, *Wm. Boott*; brook in cold bog, Shirley, August 27, 1916, *Churchill*; brooksides, Uxbridge, June 23, 1876, *Morong*; shore of small pond, Granville, *F. C. Seymour*, no. 388; New Salem, July 28, 1931, *Goodale, Potshay & St. John*; brookside, New Marlboro, August 30, 1902, *Ralph Hoffmann*. CONNECTICUT: West Hartford, July 13, 1901, *H. J. Koehler*; swamp, Southington, *Bissell*, no. 722; New Hartford, August 10, 1883, *Chas. Wright*; along Steele Brook, Waterbury, *Blewitt*, no. 456; open swamp, Milford, *E. H. Eames*, no. 4000. NEW YORK: wet ditch, Fort Anne, Washington County, *Burnham*, no. 46; along a cold stream, 4 miles south of Utica, *Haberer*, no. 1184; Waterville, Oneida County, August 18, 1917, *House*. NEW JERSEY: Rosenkraus Run, Sussex County, August 11, 1917, *E. B. Bartram*. PENNSYLVANIA: open marshy, springy swale, Lehigh Gap Station, *Pretz*, no. 13,253; roadside ditch, 2 miles north of Sadsburyville, Chester County, June 29, 1924, *H. E. Stone*; Big Meadow Run, Farmington, Fayette County, June 4, 1931, *Core*. DELAWARE: along brooks, Centreville, August, 1869, *Commons*. DISTRICT OF COLUMBIA: Washington, 1881 ("the most southern locality known"), *Scribner*. VIRGINIA: South Fork of Holston River, St. Clair's Bottom, Smyth County, July 30, 1892, *Small*. NORTH CAROLINA: near Hickory, Catawba County, *Heller*, no. 274. GEORGIA: in cool shaded brook at northern base of Stone Mountain, *Harper*, no. 205. MICHIGAN: swamp, Grand Rapids, July 20, 1900, *Emma J. Cole*.

Scirpus expansus is the plant which regularly passes in the eastern United States as *S. sylvaticus* L. of Eurasia. The resemblance is merely superficial, for in most characters there are clear distinctions. *S. sylvaticus* has thinner leaves, with scarious sheaths, the summit of the inner band easily friable, the blades 6–14 mm. wide; in *S. expansus* the hard and thickish blades are 1–2.5 cm. broad, the coriaceous sheaths strongly septate-nodulose (in *S. sylvaticus* only faintly, if at all, so), the summit of the inner band firmer. In *S. sylvaticus* the relatively slender culm is smooth to summit; in *S. expansus* the usually coarser culm is scabrous at summit (for 1–5 cm.). In *S. sylvaticus* the longest smooth and thin leaf of the involucre is 0.7–2 dm. long, only rarely exceeding the panicle; in *S. expansus* it is firm and harshly scabrous beneath and 1.5–3 dm. long, often overtopping the panicle. In *S. sylvaticus* the mature panicle is lax, with loosely spreading to recurving longer rays, the panicle 1–2 dm. high; in *S. expansus* the longer rays (FIG. 4) are more stiffly ascending to divergent, only the short basal ones much recurving, and the panicle, when well developed, is 1.5–3 dm. high. In *S. sylvaticus* the spikelets (FIGS. 4 and 5) are 3–4 mm. long and in glomerules of 2–5, the ultimate lateral pedicels often terminated by single spikelets; in *S. expansus* the principal glomerules have 3–12 (rarely to 40) spikelets 3–5 mm. long, only a rare ultimate pedicel with a solitary one. In *S. sylvaticus* the pedicels are minutely scabridulous; in *S. expansus* closely pilose. In *S. sylvaticus* the scales of the spikelet (FIG. 5) are blunt or barely mucronate by the extension of the relatively weak midrib; in *S. expansus* they (FIG. 3) have subulate-acuminate tips, through the extension of the very prominent keel-like midrib. In *S. sylvaticus* the anthers (FIG. 5) are 0.7–1 mm. long; in *S. expansus* (FIG. 3) 1.3–1.6 mm. long.

Forma **Bisselli** (Fernald), comb. nov. *S. sylvaticus*, var. *Bisselli* Fernald in *RHODORA*, ii. 21 (1905); *S. microcarpus*, var. *Bisselli* (Fern.) House in *Bull. N. Y. State Mus.* nos. 243–244: 18 (1923). *S. sylvaticus*, forma *Bisselli* (Fern.) Carpenter in Dole, *Fl. Vt.* ed. 3: 76 (1937).

Forma **globulosus**, f. nov., glomerulis globosis 7–12 mm. diametro, spiculis 20–60 congestis valde imbricatis 3–4 mm. longis.—NEW YORK: Lyon's Falls, Lewis County, August, 1882, *J. V. Haberer* (TYPE in *Herb. Gray.*).

A very unusual extreme, the inflorescence, with large globose heads of very numerous spikelets superficially suggesting the most extreme *Juncus canadensis* J. Gay. Not to be confused with forma *Bissellii*. That has the large glomerules 1–2 cm. in diameter and composed of loosely divergent linear-cylindric spikelets 6–14 mm. long.

Since some botanists place *Scirpus expansus* under the western North American *S. microcarpus* Presl, it is well to point out that *S. microcarpus* has 2 stigmas and lenticular achenes; *S. expansus* 3 stigmas and trigonous achenes. In *S. microcarpus* the smooth or nearly smooth leaf-sheaths and the leaf-blades are thinner and smoother than in *S. expansus*, the involucre only slightly if at all exceeding the inflorescence; as contrasted with the heavier and septate-nodulose sheaths of *S. expansus*, the broader and firmer blades scabrous beneath and the usually longer involucres. In its thin and relatively narrow leaves with smooth or nearly smooth sheaths *S. microcarpus* is more like *S. sylvaticus* of Eurasia. In the texture of its scales and the size of its panicle (0.8–2 dm., only exceptionally—3 dm. high) it is more like the latter, but the glomerules have many more and usually longer spikelets. Unless all members of the section are to be reduced to an all-inclusive *S. sylvaticus*, with several constant and geographically isolated subdivisions, some with 2 stigmas, others with 3, these fundamental characters of the pistil associated with other characters, the three North American members of the series, *S. microcarpus* Presl, *S. rubrotinctus* Fern. and *S. expansus* are well marked species.

IN PLATE 767, FIGS. 1–3 are of *SCIRPUS EXPANSUS*, from the TYPE: FIG. 1, inflorescence, $\times \frac{2}{5}$; FIG. 2, portion of inflorescence, to show characteristic ascending branches with spikelets mostly glomerulate, $\times 3$; FIG. 3, spikelet with anthers, $\times 10$. FIGS. 4 and 5, *S. SYLVATICUS* from Tassin, France, Boulin: FIG. 4, small portion of inflorescence to show characteristic divergent branching, with lateral spikelets often solitary, $\times 3$; FIG. 5, spikelets with anthers, $\times 10$.

S. RUBROTINCTUS Fern., forma **radiosus**, f. nov., spiculis lineari-cylindricis 7–13 mm. longis in glomerulis radiosis 1.5–2.3 cm. diametro aggregatis.—MAINE: tidal swales along Cathance River, Bowdoinham, September 14 and 19, 1926, *Fernald & Long*, nos. 12,853 (TYPE in Herb. Gray.), 12,854; ditch near wharf, Camden, August 11, 1902, *G. G. Kennedy*.

The counterpart in *Scirpus rubrotinctus* of *S. expansus*, forma *Bissellii*.

S. ATROVIRENS Muhl., var. *GEORGIANUS* (Harper) Fern., forma *cephalanthus*, f. nov., *glomerulis dense confertis in capitulo 1.3-5 cm. diametro aggregatis*. TYPE: river-thicket, Veazie, Maine, August 25, 1908, *Fernald* (in Herb. Gray.).

S. ATROVIRENS Muhl., var. *GEORGIANUS* (Harper) Fern., forma *angustispicatus*, f. nov., *spiculis anguste cylindricis ad 1 cm. longis*. TYPE: wet shore of Housatonic River, Newtown, Connecticut, August 17, 1928, *E. H. Eames*, no. 10,692 (in Herb. Gray.).

S. POLYPHYLLUS Vahl, forma *macrostachys* (Boeckl.), comb. nov. Var. *macrostachys* Boeckl. in *Linnaea*, xxxvi. 731 (1870).

VI. THE IDENTITY OF *SCLERIA SETACEA* OF POIRET

One of the most definite and easily recognized species of *Scleria* is the handsome and tall cespitose but lax plant with soft and almost wing-angled easily compressed culms up to 1 m. high; broad, lax leaves up to 8 mm. wide; long, drooping, filiform, lateral peduncles and loosely fastigiate terminal panicles up to 4 cm. long; the globose and reticulate achenes with spirally arranged pits and pubescent surfaces, the hypogynium with 3 broad erect lobes. This relatively tall species occurs from warm-temperate eastern South America, the West Indies and Florida to eastern Texas and Mexico, north in the Atlantic States to Long Island, and locally in the interior to Indiana.

This is the handsome plant beautifully described as *S. laxa* by Torrey in *Ann. Lyc. N. Y.* iii. 376 (1836), Torrey's appropriate name unfortunately preempted by the Australian *S. laxa* R. Br. (1810). Somewhat earlier Muhlenberg had described the same plant from North Carolina as *S. reticularis* Muhl. *Descr. Gram.* 266 (1817), he mistaking it for *S. reticularis* Michx. (1803). This confusion was soon noted, however, and there resulted two names: *S. Muhlenbergii* Steud. *Nom. ed. 2*, ii. 543 (1841), based upon "S. laxa. *Torr. (non R. Br.)* S. reticularis *Mhlbrg. Pursh. (non Michx.)*"; and, a little later, *S. Torreyana* Walp. *Ann. iii. 696* (1852), based on *S. laxa* *Torr.* Other but later names were given to the plant; *S. Muhlenbergii* Steud., however, being the earliest available one, we may in this note omit the others, especially since their exact identification is not now possible. For this tall plant with compressed-trigonous culms, broad and

flat leaves and terminal lax panicles up to 4 cm. high Core, in his *American Species of Scleria* in *Brittonia*, ii. 79 (1936), takes up *S. setacea* Poir. in Lam. *Encyc.* vii. 4 (1806); and others, as unwittingly as myself, have trustingly followed him.

The photograph of the type of *S. setacea* Poir., however, thoroughly agrees with the original description:

8. SCLÉRIE à feuilles sétacées. *Scleria setacea*.

Scleria culmo foliisque setaceis, glaberrimis; spicis axillaribus, minimis, longè pedunculatis; spiculis angustis, pedicellatis seu subsessilibus (N.)

Ses racines sont courtes, fibreuses, fasciculées: il s'en élève des tiges nombreuses . . . , haute de huit à dix pouces & plus, très-grêles, fines, sétacées, triangulaires . . .

De l'orifice de chaque gaine, même à partir de celles du bas, il sort un pédoncule droit, très-fin, long d'un pouce & plus, terminé par deux, trois, à peine quatre épillets pédicellés, quelquefois un ou deux sessiles, petites, étroits, ovales-oblongs, aigues, d'un roux-clair, munis de petites bractées courtes, sétacées, à peu près de la longueur de l'épillet.

Cette plante croît dans l'Amérique; elle e été recueillie par M. Ledru à Porto-Ricco (*V. s. in herb. Lam.*)

It is most difficult to imagine how *Scleria Muhlenbergii* could ever have been identified with *S. setacea*, described as having setaceous culms up to 10 inches high, setaceous leaves, small red spikes, etc., the photograph before me showing the terminal inflorescence to be compact and 6–8 mm. high. Search in West Indian *Scleria* shows nothing like it, *S. Brittonii* Core and *S. georgiana* Core both having elongate horizontal rhizomes and larger terminal inflorescences; but the slender and acuminate reddish spikelets and the dense non-rhizomatous base at once suggest *Rhynchospora*. Turning to that genus, the type of *Scleria setacea* Poir. is promptly matched, even to the short-peduncled inflorescences in the lower leaf-axils, by R. SETACEA (Berg.) Boeckl., based upon *Schoenus setaceus* Bergius (1772). The fact that Poiret, in 1806, used the same specific name was merely coincidence; but the fact that his *Scleria setacea* coincides with *Schoenus setaceus*, therefore with *Rhynchospora setacea*, removes that wholly misinterpreted name from the valid species of *Scleria*. The many North American, West Indian and South American specimens recently marked "*Scleria setacea* Poir.", should be changed to *S. MUHLENBERGII* Steud.

VII. WHAT IS ANGELICA TRIQUINATA?

(Plates 768 and 769)

In his *Flora Boreali-Americanæ*, i. 167 (1803) Michaux described from "Canada" a single species of *Angelica* as

TRIQUINATA. A. petiolo tripartito; partitionibus pinnato-quinquefoliolatis; foliolis inciso-dentatis; terminalium impari rhomboideo, sessili, lateralibus decursivis.

Obs. Glabra: pedunculo pedicellisque minutissima pube subcandanticibus.

Hab. in Canada.

Pursh (1814) took it up, literally copying Michaux's diagnosis but giving the range "In Canada and on the mountains of Virginia", from which it is probable that Pursh was stretching the name to cover the later published *Angelica Curtissii* Buckl.; and others, Bigelow, Fl. Bost. (1814) for instance, accepted it for the common New England *A. atropurpurea* L.

In 1818 three different authors independently considered *Angelica triquinata* to be the plant of dry woods and thickets southward, with stem closely tomentulose above, with thick lanceolate to oblong regularly and closely serrate leaflets, the upper or bracteal leaves (subtending inflorescences) reduced to linear-cylindric or lanceolate tubular sheaths with tiny blades, the plant which Walter, Fl. Carol. 115 (1788) had well described as *Ferula villosa*, i. e. *Angelica villosa* (Walt.) BSP. Muhlenberg, Cat. ed. 2: 30 (1818), substituted for *A. triquinata* Michx. his own *A. hirsuta*, saying without quibble ANGÉLICA . . . "1 hirsuta, triquinata, Mx." and giving the single descriptive word, "downy", Muhlenberg's plant coming from "Pens. fl. Aug. N. Eb." At best *A. hirsuta* Muhl. is a nomen subnudum; but since he used the name as a substitute¹ for *A. triquinata* Michx. (1803) it is illegitimate. Nuttall, also in 1818, took up *A. triquinata*, obviously for *Ferula villosa* Walt. His description of the plant "Common around Philadelphia" was good, except for the phrase, "Leaves sharply and incisely serrate", evidently borrowed from Michaux; and, obviously not understanding Michaux's plant, he commented on the plant of "Canada to

¹ In his Cat. ed. 1: 31 (1813) Muhlenberg had published the trinomial *Angelica hirsuta triquinata* as a "downy" plant of "Pens." It was in the 2nd edition (1818) that he cited *A. triquinata* Michx. as a synonym of his *A. hirsuta*.

Carolina" as "Certainly a genuine species". In the same year Sprengel, *Species Umbelliferarum minus cognitae*, 69, t. vi. fig. 12 (1818), based his *Pastinaca triquinata* upon *Angelica triquinata* Michx., "Habitat in Canada et Virginia" (borrowed from Pursh), and gave a fine description and excellent illustration of *Ferula villosa* Walt., changing the "Foliolis inciso-dentatis; terminalium impari rhombeo, sessili" etc. of Michaux (impossible for *Ferula villosa*) to "foliolis oblongis" of *F. villosa*, and noting the reduced upper blades and sheath-like petioles of the latter, "Superiora minus divisa vaginis petiolaribus insidentia".

Many authors followed these false leads and the name *Angelica triquinata* Michx. became general, as the first supposedly available combination under *Angelica* (following the sensible, therefore abandoned, "Kew Rule") for *Ferula villosa* Walt.; not merely Nuttall and Sprengel so using it, but Elliott, Torrey, DeCandolle and others accepting the identification. When Sprengel took it up as the basis of *Pastinaca triquinata* (Michx.) Spreng. he did so in a work on *Umbelliferae* "minus cognitae", and his phrase very definitely described his understanding of Michaux's plant. When he first studied Michaux's herbarium Asa Gray saw the error, his memorandum reading "Not the least what we call *A. triquinata* DC. has confounded strangely if he ever saw Michx's. plant . . . It is *A. atropurpurea*?—tho' very poor specimen".

Gray's guess is hardly better than that of his predecessors, for even his "tho' very poor specimen" does not endow the Michaux plant with the characters of *A. atropurpurea*. In the latter the upper leaves, which subtend inflorescences, have large, inflated and round-tipped stipular sheaths extending quite to the summit of the obscure petiole, so that the 3 divisions of the leaf are essentially sessile, and the leaflets are not incised-dentate. Furthermore, the subspherical umbel has 20–46 rays. In 1903 I made a photograph of the Michaux TYPE at Paris. This (PLATE 768) shows, $\times \frac{1}{2}$, the incised-dentate leaflets, the terminal unequally rhombic, the lateral decurrent, as described by Michaux. It also shows the stipular sheath narrow and tapering to the elongate and naked upper half of the petiole; and the axillary branch has one slender and tubular bladeless sheath and an immature umbel with only 7 ascending rays. I have been over, with Dr. Hugh M. Raup, all known eastern North

American *Umbelliferae*. Every one of them is quickly rejected as not Michaux's plant, except the Alleghenian *A. Curtisi* Buckley, Am. Journ. Sci. xlv. 173 (1843) which follows the upland and the mountains from Pennsylvania to Georgia. Buckley's species gives a good match for *A. triquinata*, a more modern specimen from the Blue Ridge of Virginia (near Luray, alt. 3600 ft., Steele & Steele, no. 213), reproduced as PLATE 769, showing a portion of a plant, $\times \frac{1}{2}$, with the tapering sheath (at base), the elongate petiole (near base), the incised leaflets, the terminal one rhombic, the lateral (upper) ones decurrent and the few-rayed umbel of the Michaux type. Buckley's plant, from "High mountains of North Carolina" had "petioles large, long, and sheathed at the base; segments of the leaves 3-5, leaflets large and deeply laciniate". It is evident that "Canada" of Michaux's label and description was a clerical error for CAROLINA, Michaux having collected extensively in the Carolina mountains. It is clear, then, that the name *Angelica Curtisi* Buckley (1843) must give way to *A. TRIQUINATA* Michx. (1803).

Another reason for thus reviewing the interpretations of *Angelica triquinata* is the fact that the name *A. villosa* (Walt.) BSP. Prelim. Cat. N. Y. 22 (1888) is a later homonym, invalidated by the fully described *A. villosa* Lagascea, Gen. et Sp. Pl. 12 (1816), a plant of Asturia. Since, furthermore, *A. hirsuta* Muhl. was an illegitimate substitute for *A. triquinata* Michx., the name *hirsuta* used very carelessly for a plant which is not hirsute but said to be "downy" (many a youth with downy face has anxiously waited for it to become hirsute), the name *A. triquinata*, long used for *A. villosa*, seemed to come into the running. That it cannot be taken up for *A. villosa* (Walt.) BSP. should be sufficiently clear.

Only one other name is sometimes cited as synonymous with *Angelica villosa* (Walt.) BSP. This is *Cicuta venenosa* Greenway in Trans. Am. Phil. Soc. iii. 235 (1793), incorrectly cited by Pursh as *C. venenata* in his synonymy of *Ferula villosa*. Greenway, not now a well known botanist, was "Dr. James Greenway, of Dinwiddie-County, in Virginia." His account of the plant as an acute poison when eaten and his very detailed description are conclusive. It is unnecessary to quote the whole, but Dr. Greenway's solicitude for the Philosophical Society, to whom he



Angelica
triquinata

in Canad.

Photo. M. L. Fernald.

Type of *ANGELICA TRIQUINATA* Michx., $\times \frac{1}{2}$.



Photo. B. G. Schubert.

ANGELICA TRIQUINATA Michx: portion of plant, $\times \frac{1}{2}$, of *A. Curtisii* Buckley.

communicated his paper on February 19, 1790, is worth quoting: "I will here insert the description, as it stands in my catalogue, first, in botanical terms, for such as are lovers of that science, and then in language, as plainly English as the subject will admit, for the sake of those to whom those terms are less familiar." The detailed description, with "Caulis . . . quatuor pedes altus, teres, . . . superne tomentosus.—Folia petiolata, petiolis semi-amplexicaulibus, . . . triternata, bipinnata, . . . foliolis sessilibus, oblongo-lanceolatis, serratis", and the habitat and flowering season (in Dinwiddie County), "Locis campestribus et collibus apricis gaudet: mensibus Julii Augustique floret", are wholly indicative of *A. villosa*. The latter should, therefore, be called:

ANGELICA venenosa (Greenway), comb. nov. *Cicuta venenosa* Greenway in *Trans. Am. Phil. Soc.* iii. 335 (1793). *Ferula villosa* Walt. *Fl. Carol.* 115 (1788). *A. triquinata* sensu Nutt. *Gen. i.* 186 (1818) and later authors, not Michx. (1803). *Pastinaca triquinata* Spreng. *Spec. Umb.* 69, t. vi. fig. 12 (1818) as to plant described and illustrated, not as to source of epithet, *A. triquinata* Michx. *Archangelica hirsuta* Torr. & Gr. *Fl. N. Am.* i. 622 (1840) as to plant described, only in part upon source of epithet, *Angelica hirsuta* Muhl. *Cat. ed. 2: 30* (1818), an illegitimate substitute (as treated by Muhlenberg) for the early *A. triquinata* Michx. (1803). *A. villosa* (Walt.) BSP. *Prelim. Cat. N. Y.* 22 (1888) by inference only, not *A. villosa* Lagasca, *Gen. et Sp. Pl.* 12 (1816).

MEMORANDUM REGARDING JAMES GREENWAY.—I am indebted to Mr. J. M. Townsend of Petersburg, Virginia, for a reference to Castiglioni's *Reise durch die Vereinigten Staaten von Nord-Amerika in den Jahren 1785, 1786 und 1787*. On p. 274 of this German translation we read:

"Eine Meile von Petersburg liegt die Wohnung des Obristen **Banister**, der eine ausgedehnte Pflanzung besitzt. Er ist ein Enkel des berühmten **John Banister**, der seine Stelle als Professor der Botanik und Bibliothekar der Universität Oxford niederlegte, und sich in diesem Thiele von Virginien niederliess, wo er mit grosser Mühe und seltenem Urtheil eine Menge der seltensten Pflanzen sammelte, und beschrieb. . . Am folgenden Tage stattete ich einen Besuch beym **D. Greenway** ab, der ein Engländer von Geburt, und ein Liebhaber der Botanik ist. Er hatte sich selbst mit den Grundsätzen des Linneischen Systems be-

kannt gemacht, und wusste mehr als 600 Pflanzen zu nennen, unter denen einige ziemlich seltene und noch unbeschriebene waren."

Mr. Townsend also most kindly transcribes for me extracts about Dr. James Greenway from the recently (1942) published Dinwiddie County "The Country of the Apamaticca", compiled by the workers of the Writer's Program of the Works Projects Administration. From this account (p. 77) I quote: "It was after he had established himself in Dinwiddie as a man of wealth and importance—somewhat Scottish as he was—that he turned his whole attention to natural history and botany. Some 40 volumes that deal with plants of Virginia and North Carolina flowed from his pen and won him honorary membership in several European societies and friendships with scholars the world over. Thomas Jefferson, that great patron of learning, frequently corresponded with Dr. Greenway and gave consistent encouragement to the botanical investigations of the Dinwiddie scientist."

I have hunted in vain, with the collaboration of Dr. Schubert, for the "40 volumes that deal with plants". Pritzel (Thesaurus) did not know of them. Dryander, Cat. Bibl. Hist.-Nat. Banks, iii. 542 and 598 (1797) and the Royal Society Catalogue, iii. 5 (1869) could muster only the two short papers in vol. iii. of the American Philosophical Society's Transactions (1793), the first on *Cassia Chamaecrista* as a soil-renovator, the second the account of *Cicuta venenosa*. If, contemporary with Thomas Walter (1788) and prior to Michaux (1803), Pursh (1814) and Elliott (1816 et seq.), there were two score volumes published, describing in such clear diagnoses as that of *Cicuta venenosa* 600 plants of Virginia and North Carolina, their discovery would be of utmost importance and extremely disconcerting.

Through the most helpful cooperation of Messrs. Jack Dalton of the Alderman Library at the University of Virginia and R. W. Church of the Virginia State Library the excitement among taxonomists over the "40 volumes that deal with plants of Virginia and North Carolina [which] flowed from his [Greenway's] pen" is now abated. Under date of November 21, 1942, Mr. Dalton wrote: "The reference . . . puzzles us as much as it does you. I have examined our catalogues, the calendars of

Jefferson's Correspondence, the bibliographies, English and American, available here, and *Swem's Index*, and have not been able to find the slightest evidence of the existence of the forty volumes or the voluminous correspondence of Jefferson. Dr. Greenway's name is not mentioned in our calendar of Jefferson's correspondence". Mr. Church, examining the notes made by the Virginia Writer's Project in connection with their history of Dinwiddie County, found that the statement concerning the forty volumes was derived from the Memoirs of Lieutenant General Winfield Scott, vol. 1, pp. 3-6 of the edition of 1864. Here is the quotation as filed by the authors of the history of Dinwiddie County:

"His professional reputation brought him patients from a wide circumference, but, as he became rich, he gradually withdrew from the practice of medicine, and gave himself up to the culture of polite literature and natural history, particularly botany, and left a *hortus siccus* of some forty folio volumes in which all the more interesting plants, etc., of Virginia and North Carolina, were described in classical English and Latin."

A *hortus siccus* being a collection of dried plants (an herbarium) it is evident that the presumably very accurate descriptions of Greenway which "flowed from his pen" did not reach publication.

In publishing the genus GREENWAYA Giseke, Praelect. Ord. Nat. Plant. 226 (1792), wrote: "in honorem Cl. . . . GREENWAY, Med. Dris. in Virginia, cuius amicitiam & cum eo commercium debui epistolarum Cl. Drury, inter Entomologos celebri. Misit ille ab a. 1773-1775. plantas Virginicas siccatas, vivas a se collectas, ad 400. eo fine ad me, ut novam Floram Virginicam juncto labore concinnaremus, sed bello inter Anglos & colonias orto, conatus omnis profligatus est, ita ut nesciam num vivus adhuc supersit nec-ne? Eo tamen labore utique de Botanica meritus est".

(To be continued)

OUR VARIETIES OF *BARBAREA VULGARIS*.—The introduced and naturalized *Barbarea vulgaris* R. Br. occurs with us as four well defined varieties. These I am distinguishing as follows:

Pedicels ascending to appressed or erect; siliques erect or strongly ascending, closely overlapping, the raceme dense.
 Siliques (excluding beak) 1.5–3 cm. long. *B. vulgaris* (typical).
 Siliques (excluding beak) 0.8–1.5 cm. long. Var. *sylvestris*.
 Pedicels spreading; siliques arcuate-ascending to horizontally divergent, not imbricated, the raceme lax and open.
 Siliques (excluding beak) mostly 2–3 cm. long. Var. *arcuata*.
 Siliques (excluding beak) mostly 0.7–1.5 cm. long. Var. *brachycarpa*.

Typical *Barbarea vulgaris* is the introduced plant misidentified as *B. stricta* in Gray, Man. ed. 7. It is wide-ranging in eastern America. Var. *arcuata* (J. & C. Presl) Fries is the plant called in Gray, Man. ed. 7 typical *B. vulgaris*. It is also of wide range with us. Ordinarily var. *arcuata* is quite glabrous. A form of it with basal leaves, including petioles, copiously villous-hirsute has been found in Maine and New York. This is

BARBAREA VULGARIS R. Br., var *ARCUATA* (J. & C. Presl) Fries, forma *hirsuta* (Weihe), stat. nov. *B. hirsuta* Weihe in Flora, xiii. 257 (1830). *B. vulgaris*, β . *bracteata*, sub-var. *hirsuta* (Weihe) Rouy & Foucaud, Fl. Fr. i. 198 (1893). *B. vulgaris*, var. *hirsuta* (Weihe) Fernald in RHODORA, xi. 139 (1909). *B. vulgaris*, subsp. *euvulgaris*, subforma *hirsuta* (Weihe) Hayek, Prod. Fl. Pen. Balc. i. 386 (1927).

The other two varieties are more local. Var. *sylvestris* Fries I have seen only from Anticosti Island, QUEBEC: along railroad, 25 miles inland, August 22, 1917, Victorin, no. 4364 (identified by me as var. *brachycarpa*), and from WASHINGTON: Seattle, July 1, 1889, *Piper*, no. 754. Var. *brachycarpa* is before me from various stations in Quebec, New Hampshire, Massachusetts and Connecticut. A double-flowered form, apparently of var. *arcuata* (the fruit not forming) has been found in Quebec. This is

B. VULGARIS, var. *ARCUATA*, forma *plena*, f. nov., petalis numerosissimis, staminibus petaloideis. QUEBEC: by brook, Wolfe Cove, August 6, 1902, Williams & Fernald (TYPE in Herb. Gray).—M. L. FERNALD.

Volume 45, no. 534, including pages 217–264 and plates 749–761, was issued 29 May, 1943.

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